CONTENTS

TRADE NAME	MODEL	SET AND FOLDER NO.
Admiral	Chassis 21B1 Tel. Rec. Prod. Chg. Bul. 79	220-1
Arvin	753T (Ch. RE348)	220-2
Dewald	G408	220-3
Meck	JM-717C, T, JM-721C, D, T, MM617T, MM621C, RPT, RPTB, T (Ch. 9040) Tel. Rec.	220-4
Mopar	610T	220-5
Pilot	AF-824	220-6
Silvertone	2174 (Ch. 132.035) Tel. Rec. Prod. Chg. Bul. 79	220-1
Silvertone	3110, A, 3115, A, 3160, A (Ch. 528.242, -1, -2, 528.248, -1, -2) Tel. Rec.	220-7
Silvertone	3210 (Ch. 528.241)	220-8
Sparton	342, 345, 347 (Ch. 5C3)	220-9
Sylvania	386B, BU, M, MU (Ch. 1-512-1, 1-512-2) Tel. Rec.	220-10
Wilcox-Gay	3F10 Recorder	220-11
Zenith	K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3, (Ch. 21K20-3) Tel. Rec.	220-12
Zenith	L406R (Ch. 4L42)	220-13

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SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2 IN SET #118

In later production the following changes were made in Admiral Ch. 21B1. Whenever applicable these changes may be made on sets encountered in the field which have not been changed in production.

Run 12

In Ch. 21B1, Run 12, a 1N64 germanium diode is used for the video detector and a 6AU6 tube was added, in the socket formerly occupied by the 6AL5 for keyed AGC. In sets incorporating keyed AGC, 6AU6 tubes are used for the first and second video IF amplifier and a 6AG5 is used as third video IF amplifier.

A partial schematic, showing the new circuit is given in Fig. 1 below. In addition, to the changes shown, R26, second video IF decoupling resistor is connected to 135 volts and a 150KΩ resistor was added from the junction of R18 and C20 to ground.

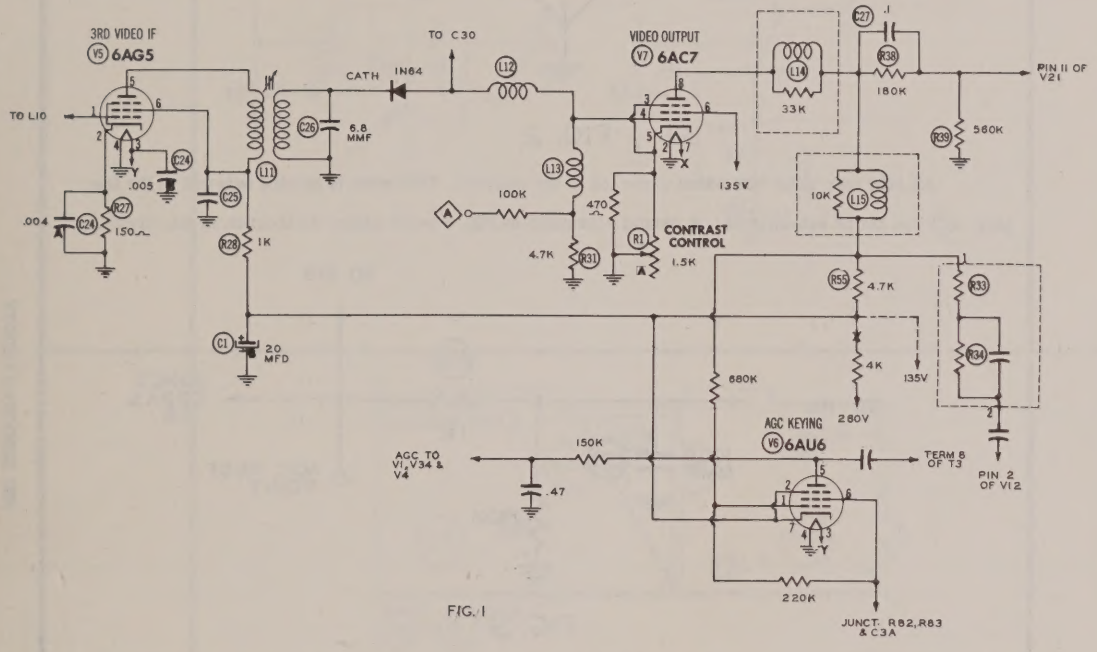

FIG. 1

Run 13

CHANGE TO PREVENT PICTURE CUTOFF AND STABILIZE PICTURE BRIGHTNESS

The following changes were made in the B+ circuits to prevent picture cutoff due to blocking the video amplifier when tuned to a strong signal. Since the AGC keying tube is dependent on voltage from the video amplifier no AGC voltage will be developed if this condition occurs.

The 4KΩ resistor, connected from 280 volts to R55 in Fig. 1 above, was omitted and points previously connected to this point are connected to 135 volts. A 7.5KΩ, 5 watt resistor was connected in parallel with R31.

The two positive terminals of C1B and C1C were tied together and connected in the position occupied by C1C.

R38 was changed from 180KΩ to 560KΩ. This change was made to prevent a decrease in brightness when a strong signal is received. R38 was later changed to 470KΩ.

These changes are shown in the dotted lines in Fig. 1 above.

(Continued on Reverse Side)

ADMIRAL CHASSIS 21B1

PRODUCTION CHANGES
BULLETIN 79

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Run 14

COLOR SOCKET AND AGC TEST POINT ADDED

A color socket and plug were added, to provide B+ and 117VAC, for future installation of a color converter. A partial schematic, showing the wiring to the socket is given in Fig. 2 below. The dotted lines shown the connections which are made when the plug is inserted to complete the circuits.

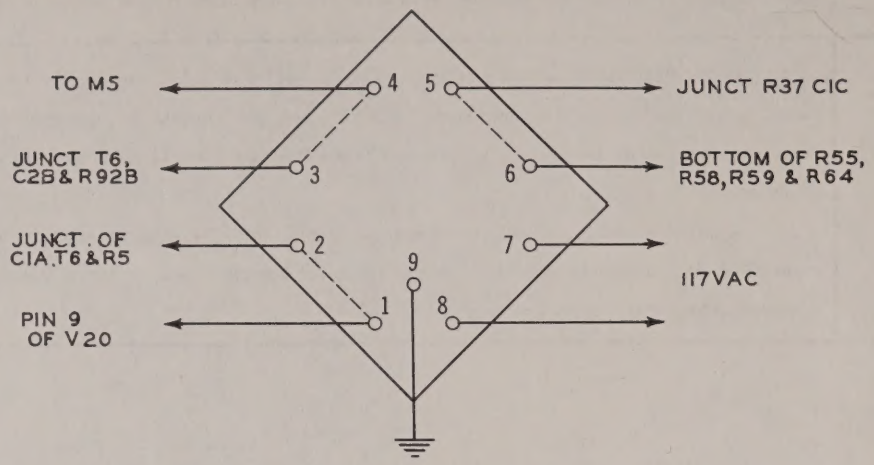

FIG. 2

An AGC test point was added to the top of the chassis. This point is located adjacent to the test jack Ⓒ on the IF sub-chassis. A partial schematic in Fig. 3 below shows its location in the circuit.

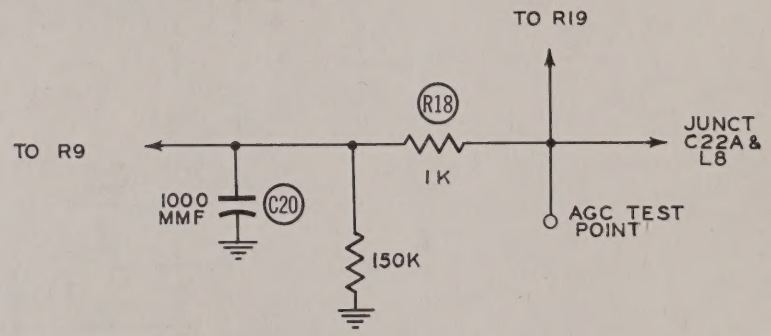

FIG. 3

Run 15

TO PREVENT VERTICAL ROLL AND PICTURE WASHOUT IN WEAK SIGNAL AREAS

Run 59 was removed.

Run 60 and C52 were removed and R61 connected directly to ground.

Pin 6 of V7 (video amp.) was removed from 135 volts and a 15KΩ, 1 watt, resistor was added from 280 volts to pin 6 of V7. A .005MFD and a 20MFD capacitor was added from pin 6 of V7 to ground.

R64 was removed from 135 volts and connected to pin 6 of V7.

R55 was changed to 3.3KΩ, w watt.

R56 was changed from an 18KΩ, ½ watt, resistor to an 18KΩ, 1 watt, resistor.

A .005MFD capacitor was added from pin 3 of V4 to ground.

A partial schematic, showing the revised circuit is given in Fig. 4 below.

A 3 1/4" length of 1/4" shield braid, insulated by a 2" length of rubber tubing, was connected, under the chassis, between the top shield of the IF sub-chassis and the main chassis.

The top side of the IF sub-chassis was, also, spot soldered to the main chassis.

A drawing showing these changes is given in Fig. 5 below.

Run 17

In all Run 17 and higher chassis the connections to the color converter socket and plug, which were added in Run 14 were omitted. In some later chassis the socket was omitted entirely.

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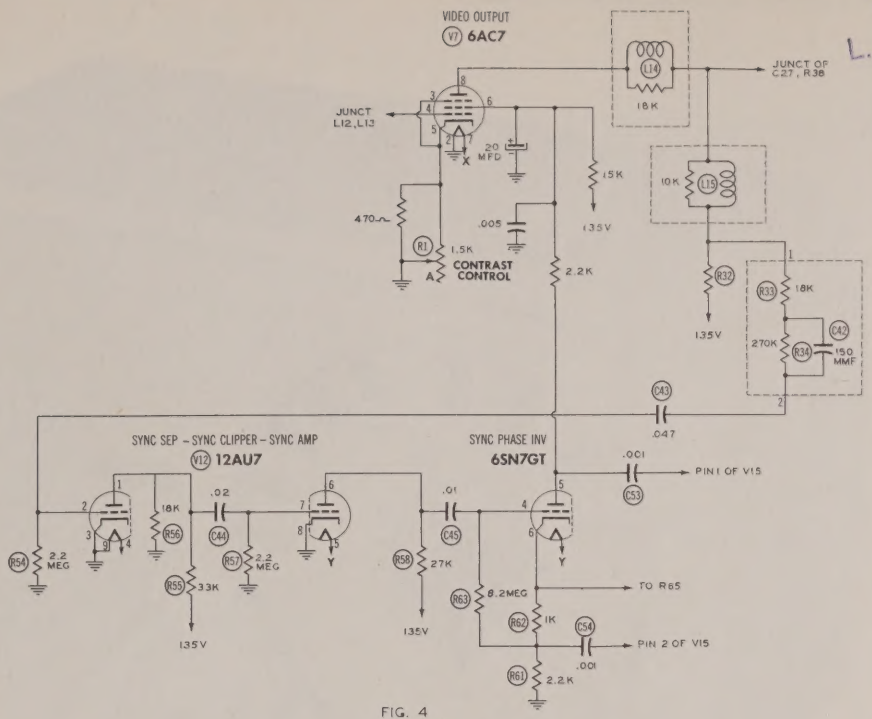

FIG. 4

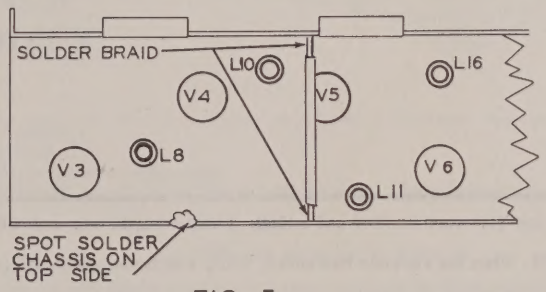

FIG. 5

ADMIRAL CHASSIS 21B1

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11 IN SET 206

Model 12174
(Ch.132.035)

Silvertone Model 2174 (Ch. 132.035) is identical to Model 3174 (Ch. 132.035-2), except for the following:

A color converter socket and plug is included in Ch. 132.035. A drawing is given below which shows the connections to this socket and plug.

A 68Ω resistor is added from the junction of C4, R46 to pin 5 of V8. NOTE: This resistor is by-passed by a jumper in the color plug above.

C59 was omitted in Ch. 132.035.

R84, in series with the height control, was changed from 1.5Meg to 1Meg.

The horizontal hold control, R3A, was changed from 50KΩ to 25KΩ and R103, the resistor in series with the control, was changed from 100KΩ to 91KΩ.

R54 was changed from 470Ω to 3.3KΩ.

R88, vertical peaking resistor, was changed from 12KΩ to 10KΩ.

The audio output screen dropping resistor, R120, was changed from 6.8KΩ to 15KΩ.

The horizontal output cathode resistor, R109, was changed from 50Ω to 220Ω.

R122, R123, R124 were omitted and R121 is a 2.2KΩ resistor.

SILVERTONE MODEL 2174 (Ch. 132. 035)

(Continued on Reverse Side)

R118 and R119 were omitted and a 100Ω, 2 watt, resistor was added between the 250 volt source and the fuse (M1). When the resistor was added, C2D, which was connected in series with C3, was removed from C3 and connected from the junction of the 100Ω resistor and the fuse to ground. The negative side of C3 was then returned to 250V.

In addition, to the above, the tuner was changed to part #N25731-1 and the On/Off/Volume and contrast control was changed to part #N22464-27. These new parts differ from the original only in shaft length.

ARVIN
MODEL 753T (Ch. RE348)

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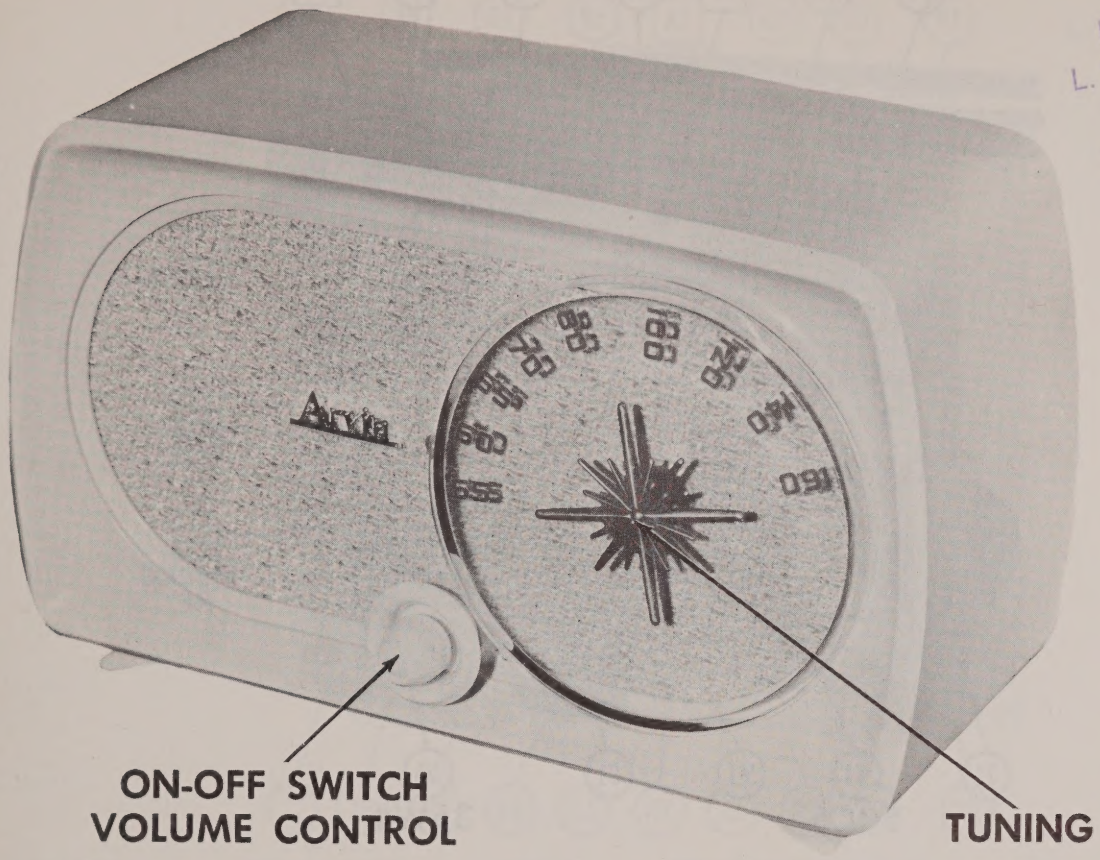
ARVIN
MODEL 753T (Ch. RE348)



ARVIN
MODEL 753T (Ch. RE348)

TRADE NAME	Arvin Model 753T (Ch. RE348)
MANUFACTURER	Arvin Industries, Columbus, Ind.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
With tuning gang fully closed set pointer to lower edge of "55" on the dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1650KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal	"	A6	"
4.		"	600KC	Tune to 600KC signal	"		Bend RF rotor plates for maximum deflection.
5.	Check tuning range and calibration at 540, 600, 1000 and 1400KC. If necessary, bend oscillator rotor plates. Repeat steps 2, 3 and 4.						

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PARTS LIST AND DESCRIPTIONS

ARVIN
MODEL 753T (Ch. RE348)

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ARVIN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■50	150	40736	AFH3-77		CO56			R1404	
B	▲30	150								
C	20	25								
C2	.05	200	25455-503	P488-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	10000		22295		D6-103			DC-511	5HK-S1	
C4A	125		*25264	*PA-112-1	*PC-70		*1406-01		*104C4	
B	5000									
C	125									
C5	.022	200	25455-203	P488-02	DD-203	PJ2S2		PT412	2TM-S2	
C6	.047	400	25462-503	689ZX-05		PJ4S5		PT415	4TM-S5	
C7	.047	400	25462-503	689ZX-05		PJ4S5		PT415	4TM-S5	

* Items C4A, C4B, C4C, and R6A and R6B are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	500KΩ	½	40846					Volume & Sw.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R2	22KΩ	½	20061-223	BTS-22K	
R3	2.2Meg	½	20061-225	BTS-2.2Meg	
R4	68Ω	½	20061-680	BTS-68	
R5	10Meg	½	20061-106	BTS-10Meg	

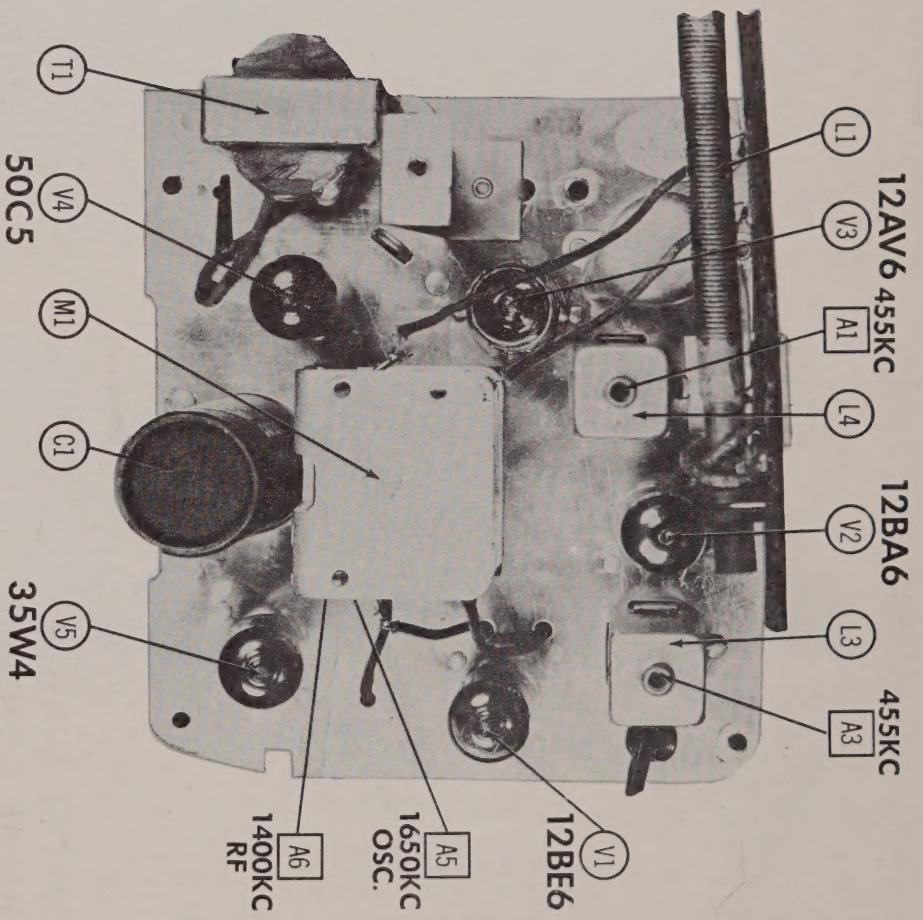
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ARVIN PART No.	IRC PART No.	
R6A	500KΩ	½	*25264		
B	500KΩ	½			
R7	120Ω	½	20061-121	BTS-120	
R8	1200Ω	1	20070-122	BTA-1200	
R9	330KΩ	½	20061-334	BTS-330K	

* Items R6A, R6B, C4A, C4B, C4C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ARVIN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.3KΩ	3.1Ω	185Ω	.4Ω	41213-1	A-3332	A-3025	RO-302 ①	S-1X ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	22875	ST-113 Mod. P4-X	4A07	

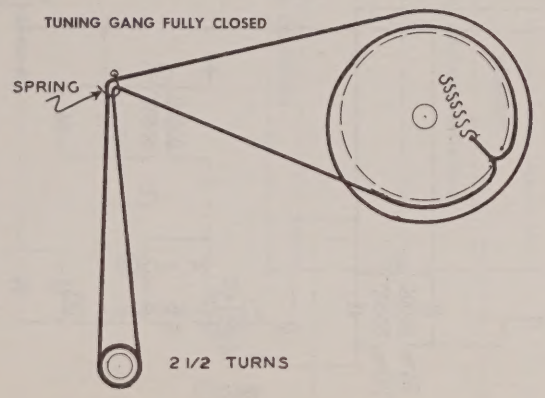
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	0Ω	.6Ω	41208-1				
L2	Osc. Coil	.7Ω	7.5Ω	41212-1	14-1073		69-Osc. *	
L3	Input IF	15Ω	15Ω	40845-1	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	40845-2	16-6770	BC-355	12-C6	

* Drill mounting hole.

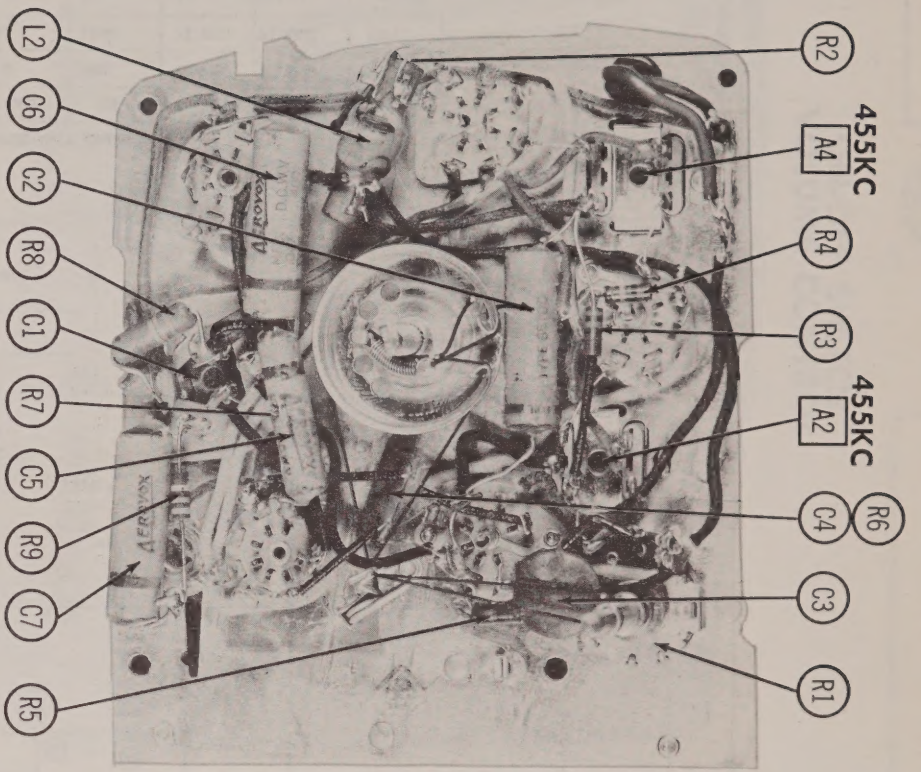
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap.	41334	21-315MMF, 21-170MMF
	Cabinet	40713-1	Walnut
	Cabinet	40713-2	Ivory
	Cabinet	40713-3	Green
	Cabinet	40713-4	Tan
	Cabinet	40713-5	Coral
	Back	41170	
	Grille Assy.	40734-1	
	Dial Glass	40765	
	Knob	40839-1	Tuning (Walnut)
	Knob	40839-2	Tuning (Ivory)
	Knob	40839-3	Tuning (Green)
	Knob	40839-4	Tuning (Tan)
	Knob	40839-5	Tuning (Coral)
	Knob	40838-1	Off/On/Volume (Walnut)
	Knob	40838-2	Off/On/Volume (Ivory)
	Knob	40838-3	Off/On/Volume (Green)
	Knob	40838-4	Off/On/Volume (Tan)
	Knob	40838-5	Off/On/Volume (Coral)



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



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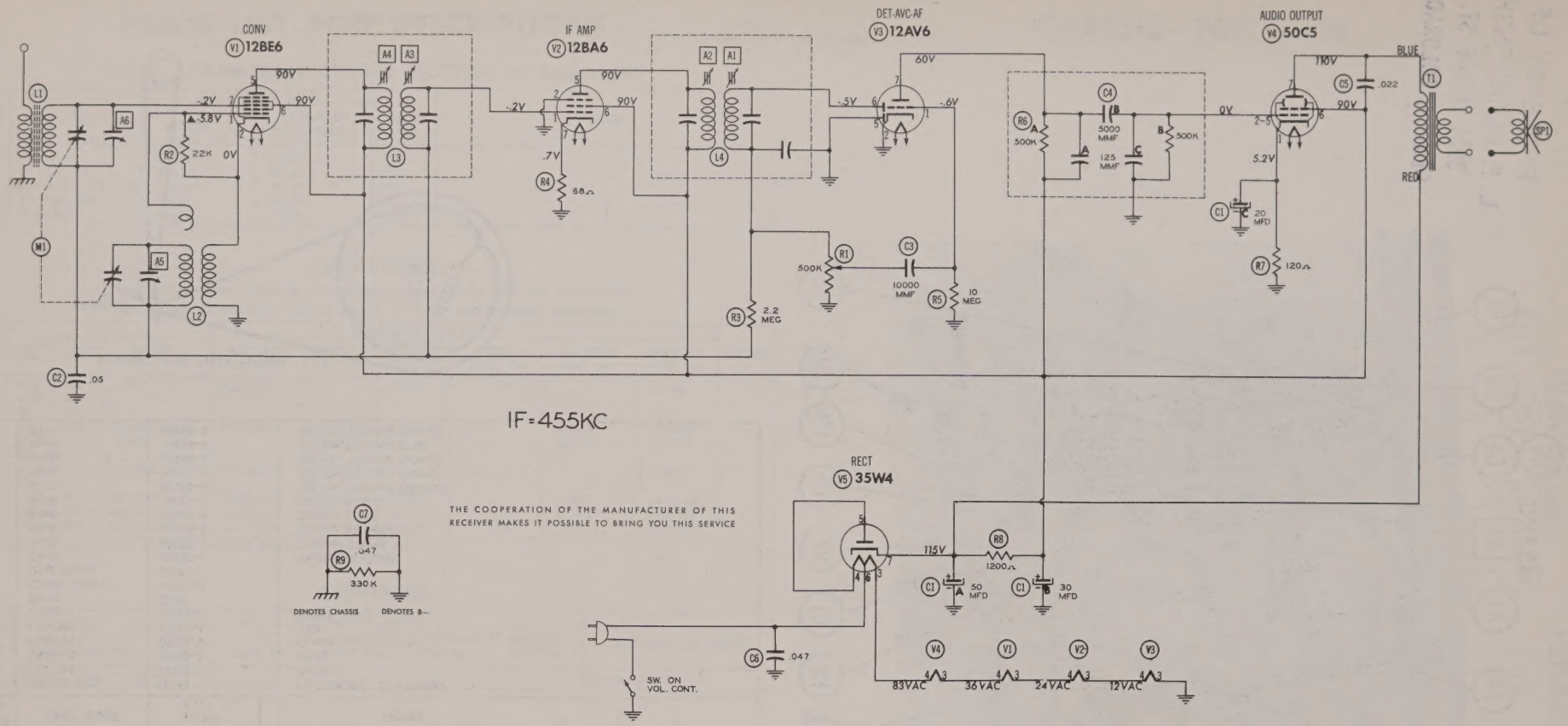

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.7Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	68Ω
V 3	12AV6	10Meg	0Ω	0Ω	12Ω	0Ω	500KΩ	†500KΩ
V 4	50C5	120Ω	500KΩ	36Ω	85Ω	500KΩ	†1.2KΩ	†185Ω
V 5	35W4	INF	INF	85Ω	120Ω	114Ω	114Ω	250KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

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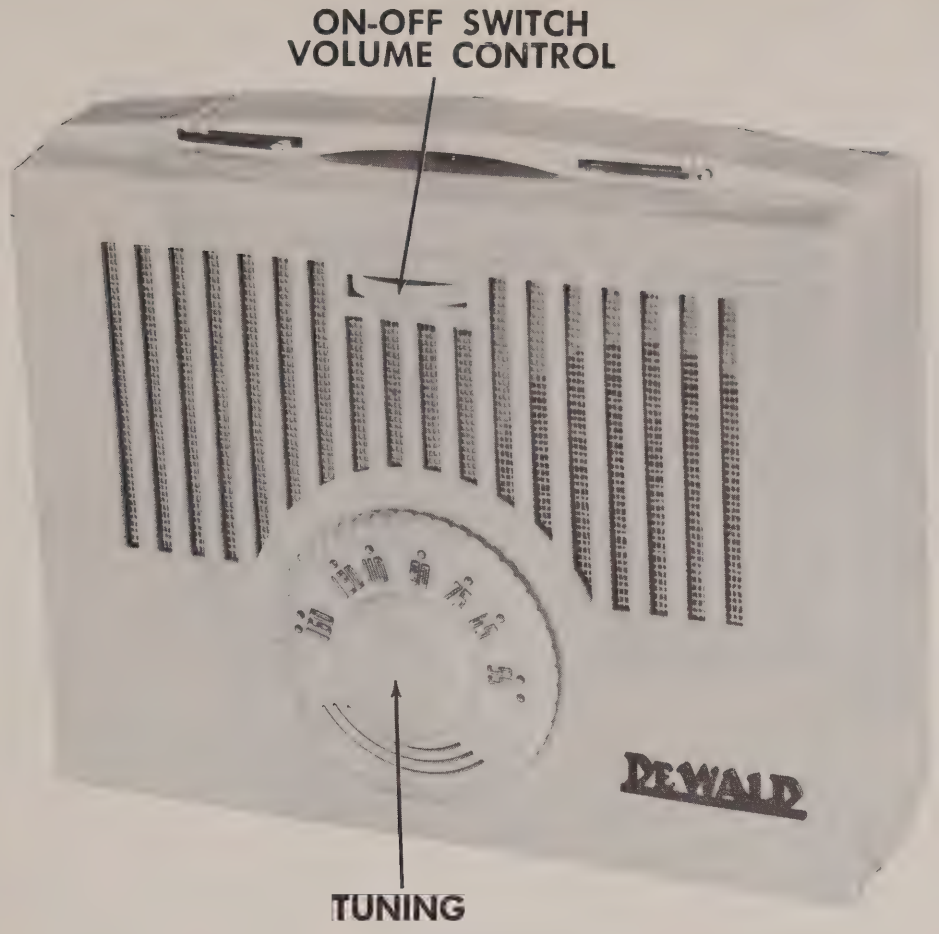

DEWALD
MODEL G408

TRADE NAME	DeWald Model G408
MANUFACTURER	DeWald Radio Mfg. Co., 35-15 37th. Ave., Long Isand City, N.Y.
TYPE SET	Battery Operated Portable Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY RATING	1.5 Volts "A" Supply & 67½ volts "B" Supply 250 MA @ 1.5 Volts DC & 10MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	535-1700KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455KC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum deflection.
2.		Loop	1700KC	"	"	A5	"
3.		"	1400KC	Tune to 1400KC signal	"	A6	"

With tuning gang fully closed set last dot to the right of "55" on the tuning dial to the index mark on the cabinet.

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PARTS LIST AND DESCRIPTIONS

DEWALD MODEL G408

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	10	250		PRS250/12		BR1025A		TC52	TVA-1504	
C2	.05	200		P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	100			BPD-0001	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C4	5000			BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5GA-D5	
C5	5000			BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5GA-D5	
C6	220			SI220	D6-221		GP2K-221	UC-5322	5GA-T22	
C7	1000			BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5GA-D1	
C8A	5000									
B	100				*PC91		*1407-03		*103C3	
C	5000									
C9	1000			BPD-001	D6-102	TM5D1	GP2L-102	DC-521	5GA-D1	
C10	20000			BPD-02	DD-203				5HK-S2	

* Items C8A, C8B and C8C, R7A, R7B and R7C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	3012-2	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	NOTES
R2	3.3Meg	½		BTS-3.3Meg	
R3	100KΩ	½		BTS-100K	
R4	10KΩ	½		BTS-10K	
R5	3.3Meg	½		BTS-3.3Meg	
R6	10Meg	½		BTS-10Meg	

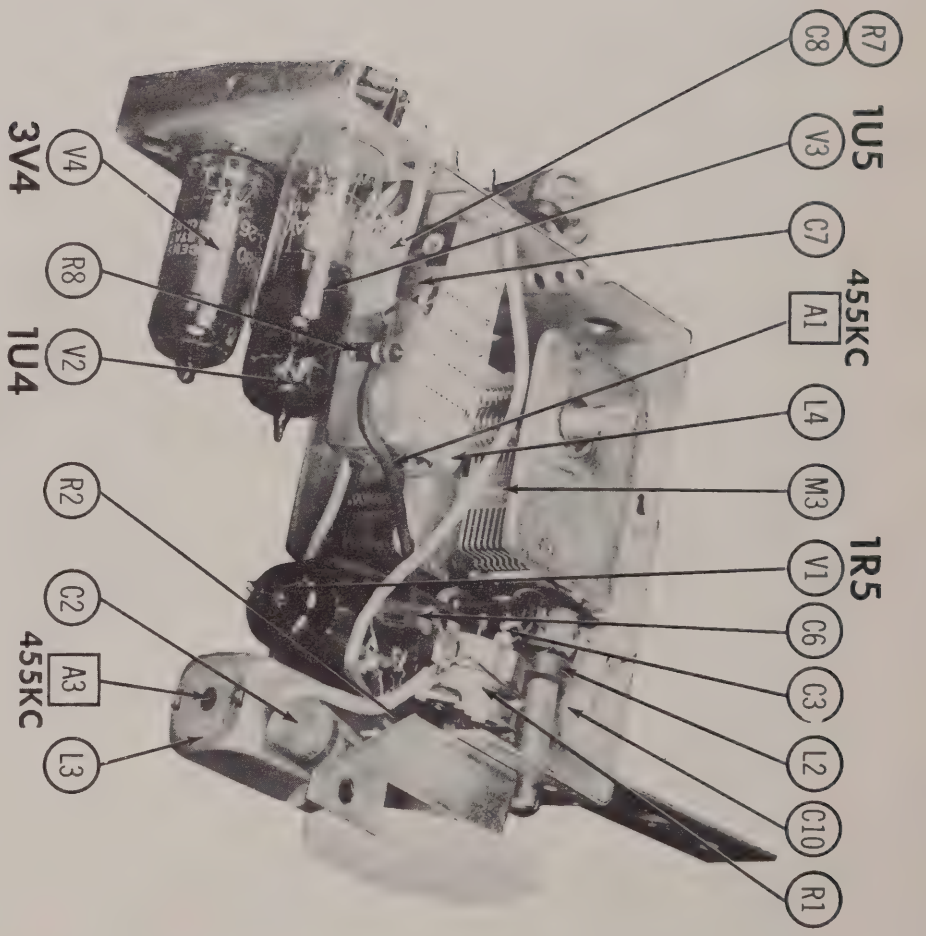
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: DEWALD PART No.	IRC PART No.	NOTES
R7A	4.7Meg	½	♦	BTS-4.7Meg	
B	1Meg	½		BTS-1Meg	
C	2.2Meg	½		BTS-2.2Meg	
R8	390Ω	½		BTS-390	

♦ Items R7A, R7B, R7C, C8A, C8B, C8C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	10KΩ	3.3Ω	400Ω	.29Ω	38J103	A-3879 ①	A-2900 ①	RO-301 ①	S-11X ①	① Bend mounting tabs down, file out slots, mount on original mounting brackets.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	DEWALD PART No.	QUAM PART No.	VIKING PART No.	
SP1	3½"	PM	3.3Ω	7032	3A07	35J4	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.9Ω		1144				
L2	Osc. Coil	1.1Ω	5.5Ω	1145			71-Osc.	
L3	Input IF	26Ω	26Ω	1091C-5	16-6758	BC-352	12-C1	
L4	Output IF	26Ω	26Ω	1091C-5	16-6758	BC-353	12-C2	

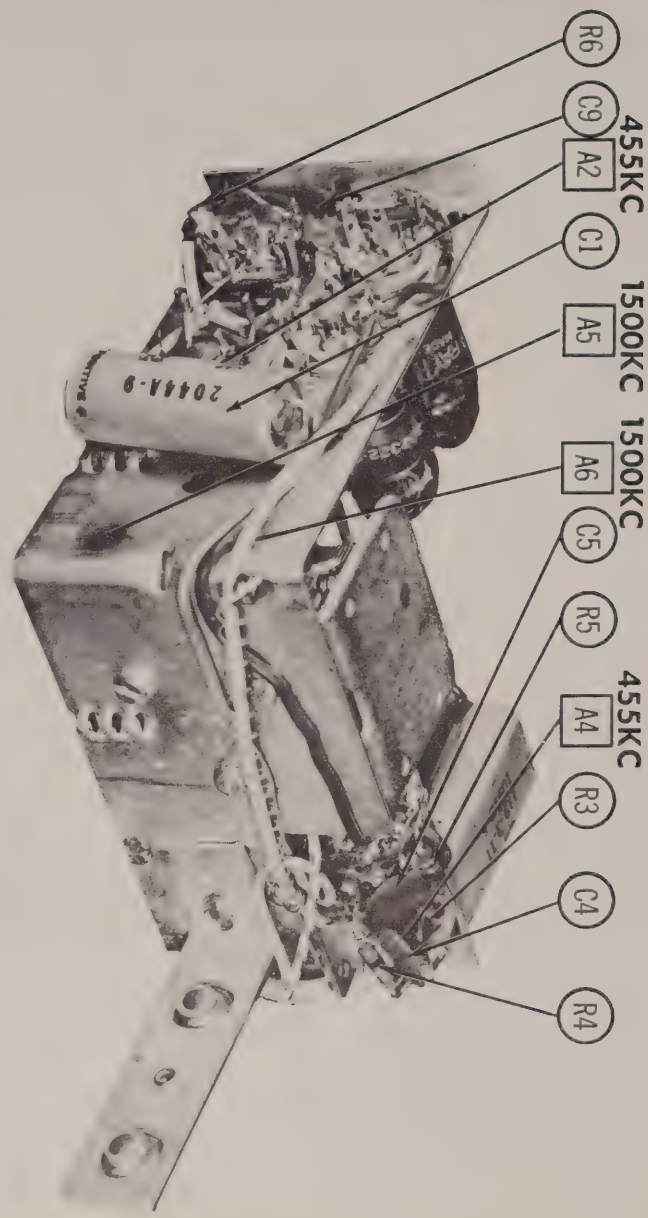
BATTERIES

ITEM No.	VOLTAGE	DEWALD PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1 M2	1.5V 67.5V		964 477			2IR P45			(2 Used in parallel)

MISCELLANEOUS

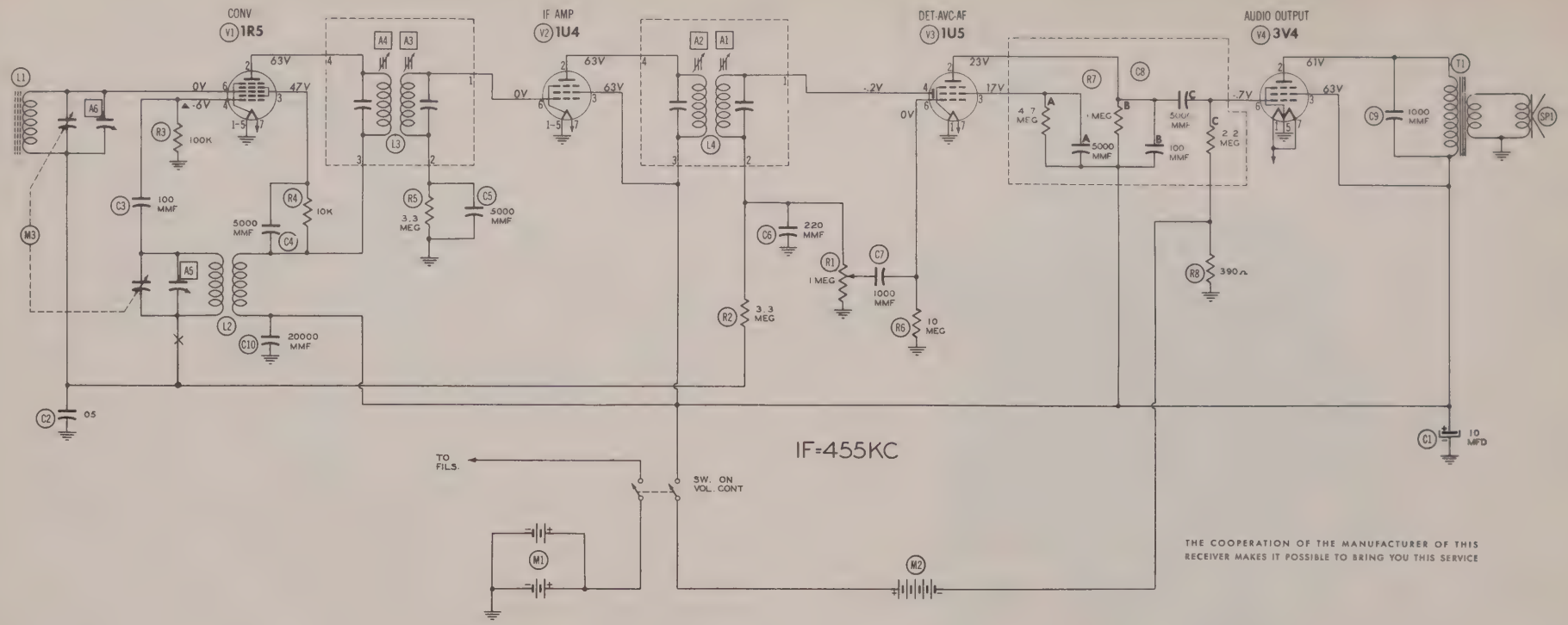
ITEM No.	PART NAME	DEWALD PART No.	NOTES
M3	Tuning Cap.	2065-3	40-462MMF, 28-190MMF
	Cabinet	4196	
	Knob	4197	Off/On/Volume
	Knob	4195	Tuning

CHASSIS—BOTTOM VIEW



DEWALD MODEL G408

DEWALD MODEL G408



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†27Ω	†10KΩ	100KΩ	*	4.3Meg	*
V 2	1U4	*	†26Ω	†0Ω	INF	*	3.3Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	INF	10Meg	*
V 4	3V4	*	†400Ω	†0Ω	INF	*	2.2Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 3 OF V4
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

MECK MODELS JM-717C, T, JM-721C, D, T, MM617T, MM621C, RPT, RPTB, T (Ch. 9040)

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DATE 11-53 SET 220 FOLDER 4

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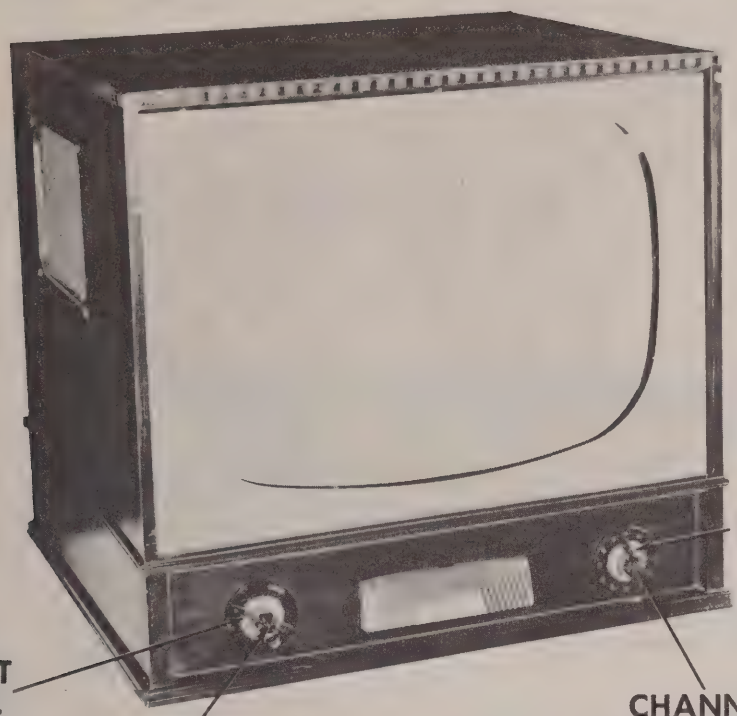

MECK MODELS
JM-717C, T, JM-721C, D, T, MM617T, MM621C, RPT, RPTB, T (Ch. 9040)

MECK MODEL JM - 721T

TRADE NAME	Meck Models JM-717C, T, JM-721C, D, T, MM-617T, MM-621C, RPT, RPTB, T (Ch. 9040)
MANUFACTURER	John Meck Industries, Plymouth, Indiana
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 1.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.1MC, Sound IF 21.6MC (Intercarrier)

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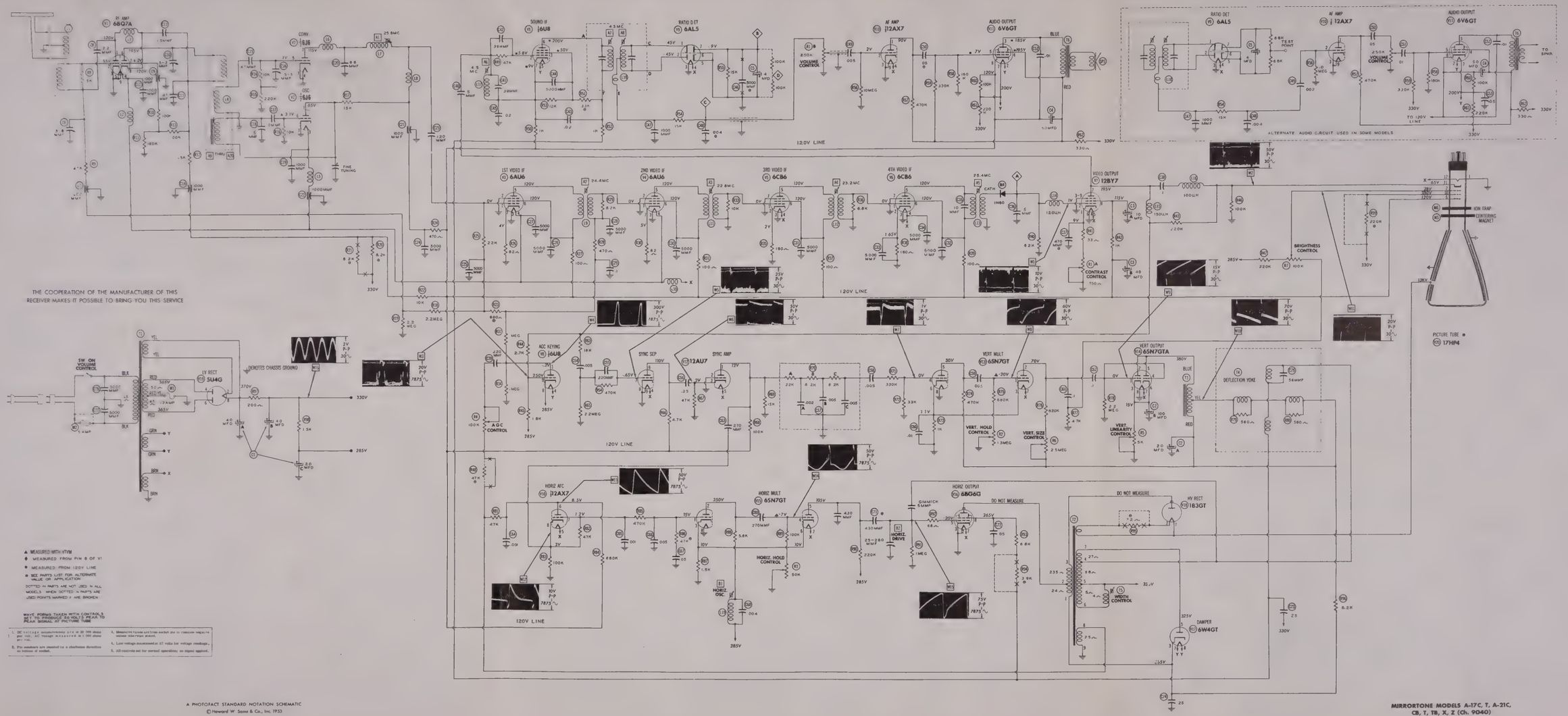
RF AMP 6BQ7A
CONV 6J6
OSC 6J6
SOUND IF 16U8
RATIO DET 6AL5
AF AMP 12AX7
AUDIO OUTPUT 6V6GT
VOLUME CONTROL
1ST VIDEO IF 6AU6
2ND VIDEO IF 6AU6
3RD VIDEO IF 6CB6
4TH VIDEO IF 6CB6
VIDEO OUTPUT 12BY7
ALTERNATE AUDIO CIRCUIT USED IN SOME MODELS
TEST POINT
TO SPKR
TO 120V LINE
KOIL TRAP
CENTERING MAGNET
PICTURE TUBE 17HP4
BRIGHTNESS CONTROL
CONTRAST CONTROL
SW ON VOLUME CONTROL
LV RECT 5U4G
DENOTES CHASSIS GROUND
ACC KEYING 16U8
AGC CONTROL
SYNC SEP
SYNC AMP 12AU7
VERT MULT 6SN7GT
VERT HOLD CONTROL
VERT. SIZE CONTROL
VERT OUTPUT 6SN7GTA
VERT LINEARITY CONTROL
DEFLECTION YOKE
HORIZ AFC 12AX7
HORIZ MULT 6SN7GT
HORIZ. HOLD CONTROL
HORIZ. OSC
HORIZ. DRIVE
HORIZ OUTPUT 6BG6G
DO NOT MEASURE
HV RECT 1B3GT
WIDTH CONTROL
DAMPER 6W4GT
120V LINE
285V
330V
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
♦ MEASURED FROM PIN 8 OF V1
● MEASURED FROM 120V LINE
■ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCT OF NORMAL LINEARITY TO PEAK SIGNAL AT PICTURE TUBE.
1. DC voltage measurements are to be made with a 20,000 ohms per volt DC meter. AC voltage measurements are 1,000 ohms per volt.
2. Tube numbers are counted in a clockwise direction as bottom of socket.
3. Measurements taken with antenna disconnected and no composite video signal present.
4. Line voltage measurement at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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MIRRORTONE MODELS A-17C, T, A-21C, CB, T, TB, X, Z (Ch. 9040)

MECK MODELS JM-717C, T, JM-721C, D, T, MM617T, MM621C, RPT, RPTB, T (Ch. 9040)

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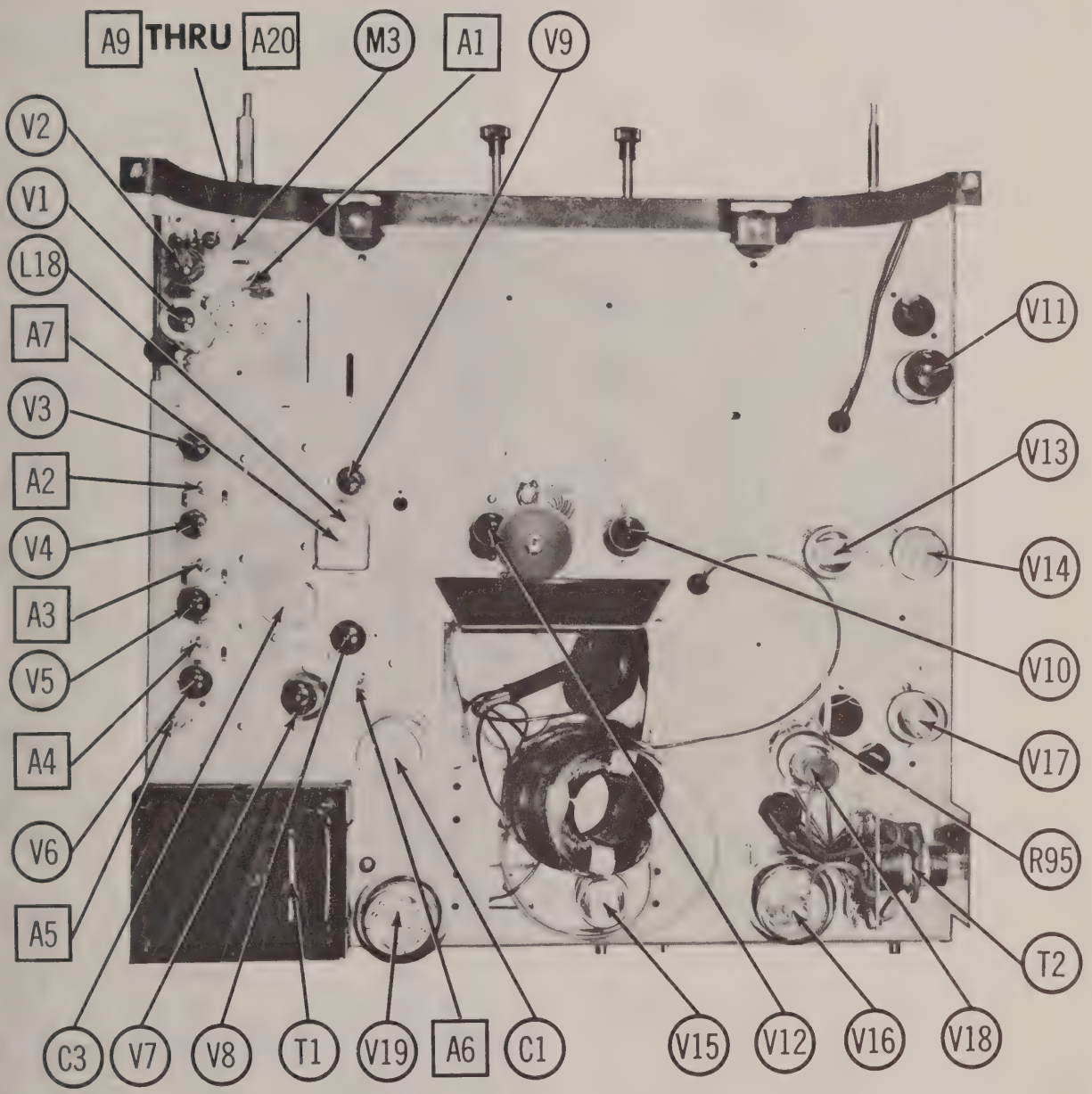

CHASSIS TOP VIEW

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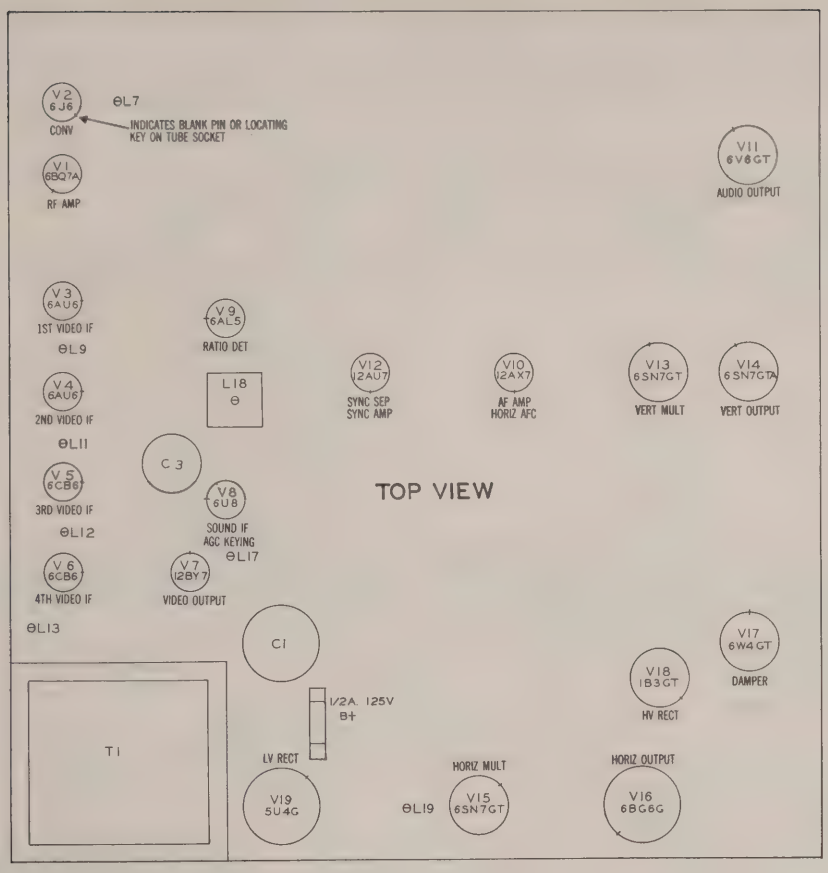
CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART



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TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V19, Fuse (M)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7, V11**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V7, V20**
Has pic, no sound - **V8, V9, V10, V11**
Overloaded picture - **V8**

SYNC FAILURE
No vert. sync - **V12, V13, V14**
No horiz. sync - **V10, V12, V15**
No vert. or horiz. sync - **V12**

SWEEP FAILURE
No raster, has sound - **V15, V16, V17, V18, V20**
No vertical deflection - **V13, V14**
Poor vert. linearity or foldover - **V13, V14**
Poor horiz. linearity or foldover - **V15, V16, V17**
Narrow picture - **V15, V16, V17, V18, V19**
Vert. off freq. - **V12, V13, V14**
Horiz. off freq. - **V10, V12, V15**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove horizontal multivibrator tube to disable the high voltage.
Individual receivers may employ one of two variations in the Video IF strip.
The first may be identified by the values of the grid load resistors on the last two IF amplifier tubes (R33 and R36), both being 6800Ω.
Alignment frequencies for this variation will be indicated in the tables by an asterisk (*).
In the other variation R33 is 10,000 ohms while R36 remains 6800 ohms. Also, in this variation, a 470Ω resistor, R28 decoupled to ground by a .001MFD capacitor is in series with the grid return to the AGC line. Alignment frequencies for this second variation will appear in the tables unmarked.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed.
This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C29 and the positive side to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	25.8MC *25.9MC	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection. Adjust generator output to maintain 1 Volt at VTVM.
2.	"	"	24.4MC *24.3MC	"	"	A2	"
3.	"	"	22.8MC *23.1MC	"	"	A3	"
4.	"	"	23.2MC *22.9MC	"	"	A4	"
5.	"	"	25.4MC *25.7MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.6MC 22.7MC 26.1MC	Any	Vert. amp to point (A) Low side to chassis.		Check for response similar to Fig.1. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (B) to chassis. The junction of these two resistors is alignment point (D) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7	Adjust for maximum meter deflection. Attenuate generator output to maintain less than 5 Volts at VTVM.
8.	"	"	"	"	DC probe to point (C) Common to point (D)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp to point (B) Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C5. Adjust for curve of maximum amplitude and symmetry as in Fig. 2.
8.	"	"	"	"	"	Vert. amp to point (C) Low side to chassis.	A8	Reconnect capacitor C5. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. Slightly retouch A7 for maximum amplitude and straightness of crossover lines.

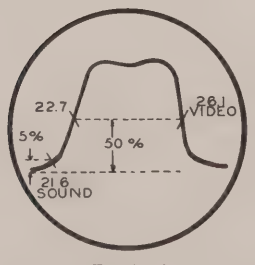

FIG. 1

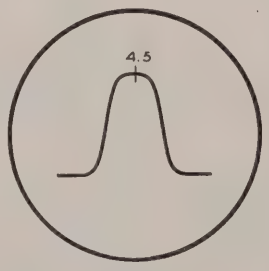

FIG. 2

ALIGNMENT INSTRUCTIONS (CONT.)

L. T. SEAVERSON
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OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket. Connect bias battery as under Video IF Alignment.
The channel oscillator adjustment screws are reached thru a hole just to the right of the channel switch sha ft. The correct adjustment screw is accessible through this hole as the channel switch is turned for each channel.
Connect the synchronized sweep voltage from sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp to point (A) Low side to chassis.	A9	Adjust to place video marker at 50% on high frequency side of video IF response curve as in Fig. 4.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A15	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A16	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A17	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A18	
			63MC (10MC Swp)	61.26MC 65.75MC	3		A19	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A20	

RF AND MIXER ALIGNMENT

The RF and Mixer portion of this receiver has been correctly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

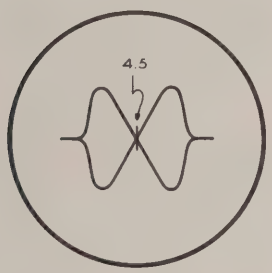


FIG. 3

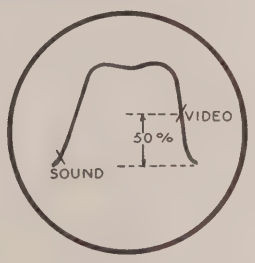
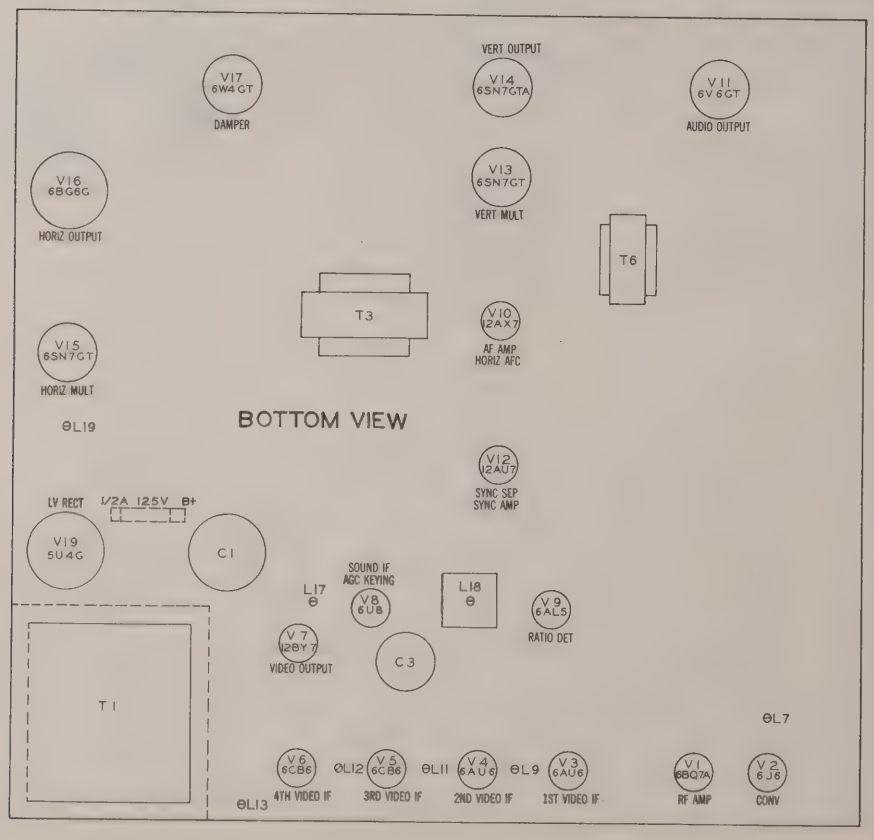


FIG. 4

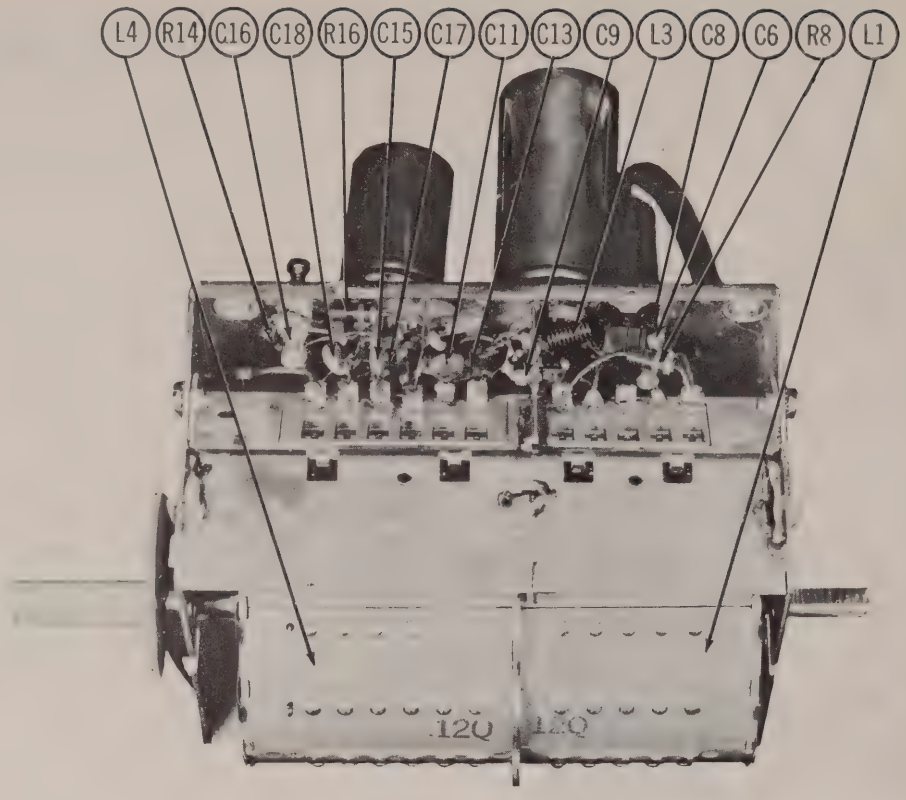
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	1.4Meg	0Ω	.1Ω	0Ω	†5.3KΩ	†175KΩ	INF	0Ω
V 2	6J6	‡15.5KΩ	‡470Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6AU6	1.4Meg	0Ω	0Ω	.1Ω	‡100Ω	‡100Ω	82Ω		
V 4	6AU6	1.4Meg	0Ω	0Ω	.1Ω	‡100Ω	‡100Ω	82Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	‡100Ω	‡100Ω	0Ω		
V 6	6CB6	.1Ω	180Ω	0Ω	.1Ω	‡100Ω	‡100Ω	0Ω		
V 7	12BY7	200Ω	8.2KΩ	0Ω	.1Ω	.1Ω	0Ω	†6.2KΩ	‡1KΩ	0Ω
V 8	6U8	850KΩ	‡48KΩ	‡13KΩ	‡70KΩ	‡70KΩ	1KΩ	‡1KΩ	†1.7KΩ	†3.5KΩ
V 9	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	15KΩ		
V 10	12AX7	†470KΩ	10Meg	0Ω	.1Ω	.1Ω	47KΩ	150KΩ	100KΩ	0Ω
V 11	6V6GT	INF	‡70KΩ	†5.5KΩ	†530Ω	†120KΩ	INF	‡70KΩ	50KΩ	
V 12	12AU7	‡40KΩ	0Ω	47KΩ	.1Ω	.1Ω	‡4.7KΩ	2.7Meg	0Ω	0Ω
V 13	6SN7GT	1.7Meg	■2.7Meg	1KΩ	33KΩ	■478KΩ	1KΩ	.1Ω	0Ω	
V 14	6SN7GTA	2.2Meg	■9.3KΩ	850Ω	2.2Meg	■9.3KΩ	850Ω	.1Ω	0Ω	
V 15	6SN7GT	620KΩ	†7.3KΩ	1.5KΩ	125KΩ	†220KΩ	1.5KΩ	0Ω	.1Ω	
V 16	6BG6G	2.5Ω	0Ω	0Ω	47KΩ	1Meg	INF	.1Ω	†11KΩ	Top Cap ■24Ω
V 17	6W4GT	INF	INF	3Meg	INF	†210Ω	INF	‡70KΩ	‡70KΩ	
V 18	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								Top Cap ■260Ω
V 19	5U4GT	INF	50KΩ	INF	50Ω	INF	47Ω	INF	50KΩ	
V 20	17HP4	0Ω	30KΩ	Pin 6 ‡ 0Ω	Pin 10 †220KΩ	Pin 11 †80KΩ	Pin 12 .1Ω			

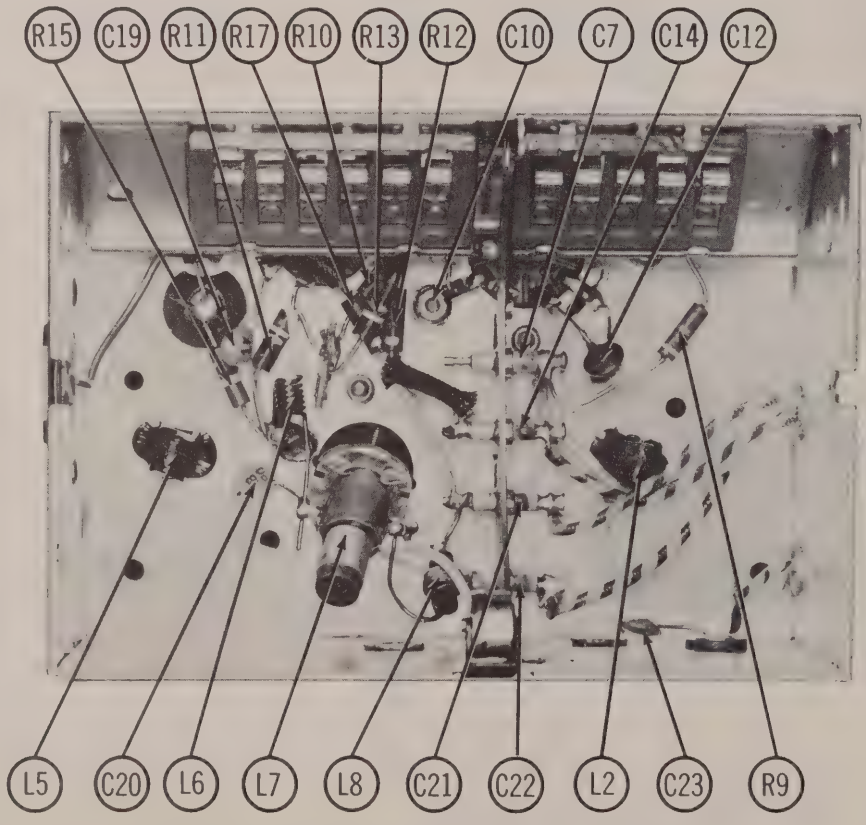
† MEASURED FROM PIN 2 OF V19.
‡ MEASURED FROM 120 VDC LINE.
■ MEASURED FROM PIN 3 OF V17.



TUBE PLACEMENT CHART

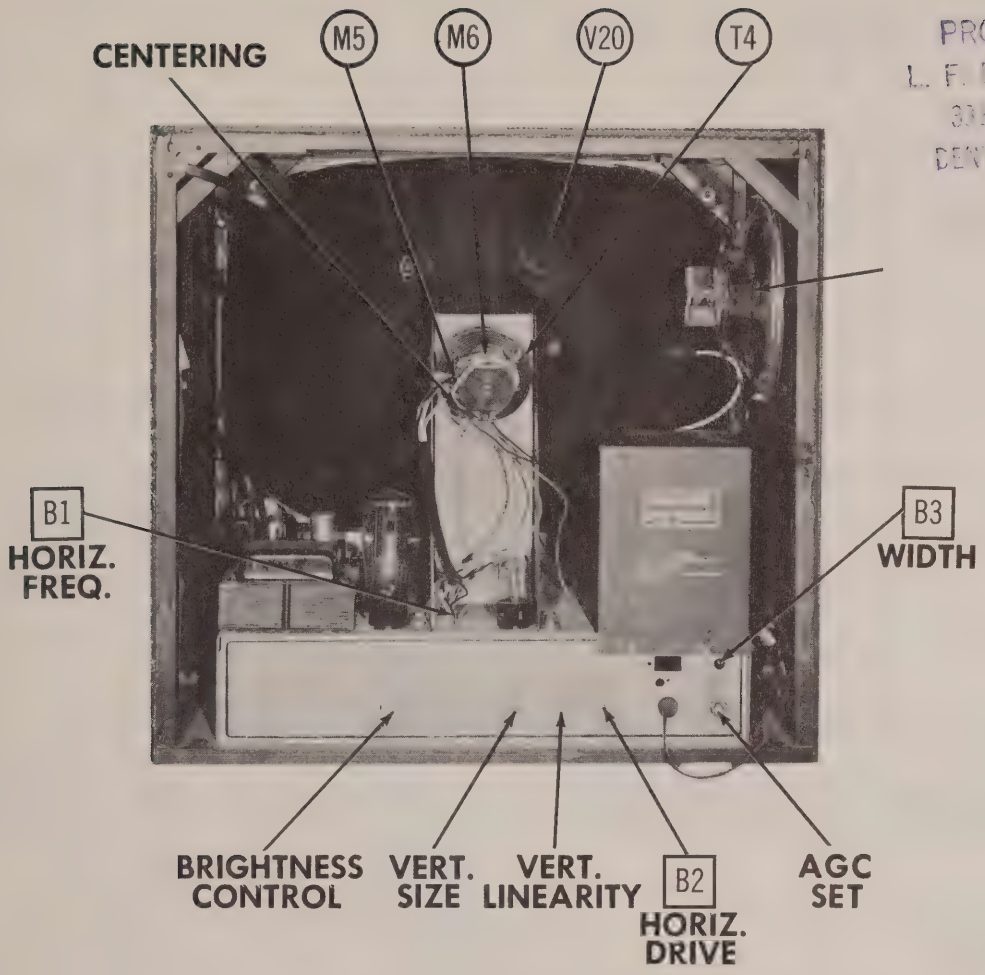


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. PLANKENHORN
DENVER, COLORADO



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at mid-position and adjust the horizontal oscillator slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines or compression of the center of the picture.

Adjust the width slug (B3) for a picture slightly wider than necessary to fill the picture mask horizontally.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

See "Loss of High Voltage".

Check amplitude of waveform W15.

If Insufficient	If Sufficient
Substitute V15 and check circuit components. Check coupling capacitor between V15 and V16.	Substitute V16 and V17. Check T2, T4A, T5, C72 and other associated components.

DRIVE LINES

Check setting of drive control (B2). Substitute V16 and V17. Check associated components.

COMPRESSED LEFT SIDE

Substitute V16 and V17. Check T2 and associated components.

FOLDS

Substitute V17. Check T2, T4A and associated components,

XMAS TREE EFFECT

Substitute V15 and check C68.

VERTICAL

LOSS OF SWEEP

Check waveform W9.

If Unsatisfactory	If Satisfactory
Substitute V13 and check associated components.	Substitute V14. Check vertical output transformer and other components of the output tube.

INSUFFICIENT SWEEP

Follow procedure outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Substitute V14 and check C2A and C2B.

FOLDS

Substitute V14. Check T3 and T4B. Check coupling capacitor between V13 and V14.

SYNC

HORIZONTAL

LOSS OF SYNC

Substitute V10 and V15. Check waveform W12;

If Unsatisfactory	If Satisfactory
Check components of sync amplifier and sync clipper. Check coupling network between V12B and V10B.	Check coupling network between V10 and V15A. Check circuit components of horizontal oscillator and discharge tube.

CRITICAL HOLD

Follow procedure outlined under "LOSS OF SYNC".

PULLING PICTURE (Fig.1)

Check C67 and R86 for open.

VERTICAL

LOSS OF SYNC

Substitute V12 and V13. Check waveform W7;

IF Unsatisfactory	If Satisfactory
Check components of sync amplifier and sync clipper. Check integrating network and coupling network between integrater and V13.	Check components of vertical oscillator and waveshaping network.

CRITICAL SYNC

Follow procedure outlined under "LOSS OF SYNC".

TRIGGERING

Substitute V13 and dress filament leads away from any grid leads of vertical oscillator.

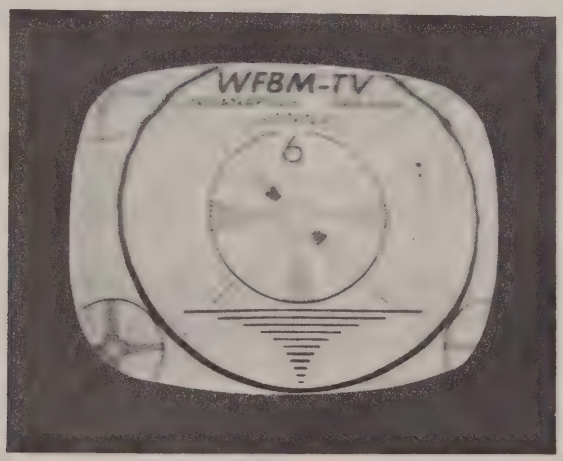


FIG.1 PULLING PICTURE
SEE HORIZ.SYNC.

ALTERNATE TUNER SCHEMATIC

ALTERNATE TUNER USED IN SOME MODELS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PROPERTY OF
L. T. BLAIR ... SHOP
... WEST 7TH
DENVER, COLORADO

PARTS LIST & DESCRIPTION

PROPERTY OF

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MECK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	9AJ	
V2	Converter	6J8	6J8	7BF	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	Sound IF Amp.- AGC Keying	6U8	6U8	9AE	
V9	Ratio Detector	6AL5	6AL5	6BT	
V10	AF Amplifier- Horiz. AFC	12AX7	12AX7	9A	
V11	Audio Output	6V6GT	6V6GT	7S	
V12	Sync Separator - Sync Amplifier	12AU7	12AU7	9A	
V13	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6SN7GTA	6SN7GTA	8BD	
V15	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V16	Horiz. Output	6BG6G	6BG6G	5BT	
V17	Damper	6W4GT	6W4GT	4CG	
V18	HV Rectifier	1B3GT	1B3GT	3C	
V19	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: MECK PART No.	REPLACEMENT DATA: SYLVANIA PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V20A	17HP4	17HP4		12C	
B	21FP4	21FP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MECK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	CLC-10075	AFH4-79		B045		FP447	TVL-3786	
B	▲40	450				BR2045A				
C	▲20	450								
C2A	20	450	CLC-10050	PR8450/20		BR2046A		TC75	TVL-2713	Red
B	100	25		PR825/100		BRB261A		TC2501		Yellow
C3A	▲10	250	CLC-10074	AFH3-28		C022		FP330.7	TVL-2817	
B	◆40	350								
C4	50	350	CLA-10087C	PR8450/50		BR5035		TC48	TVA-1713	
C5	4	50	CLA-10027A	PRS150/4		BR550		TC30	TVA-1303	
C6	3-8				839-10					503C-D1
C7	1000			CN-1-001	MFT-1000					5TCCB-V32
C8	3.2			SI2,2NP0	TCZ-2,2		NP0K-2R2			503C-D1
C9	1000			CN-1-001	MFT-1000					
C10	.5-3				839-3			CT565A		
C11	47			BPD-000047	D6-470		GP1K-470	UC-5447		5GA-Q47
C12	1000			BPD-001	DD-102	TM5D1	801-001	DC-521		5HK-D1
C13	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515		5TCCB-V15
C14	1000			CN-1-001	MFT-1000					503C-D1
C15	47			BPD-000047	D6-470		GP1K-470	UC-5447		5GA-Q47
C16	.5-3				839-3			CT565A		
C17	10			SI10N750	TCN-10		N750K-100	NT-541		5TCU-Q1
C18	5			SI5NP0	TCZ-4.7		NP0K-050	ZT-555		5TCCB-V47
C19	1000			BPD-001	DD-102	TM5D1	801-001	DC-521		5HK-D1
C20	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568		5TCCB-V68
C21	1000			CN-1-001	MFT-1000					503C-D1
C22	1000			CN-1-001	MFT-1000					503C-D1
C23	120			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312		5GA-T12
C24	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C25	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C26	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C27	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C28	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C29	.1	600		P688-1	DF-104	PTE6P1		PT601		6TM-P1
C30	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C31	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C32	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C33	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C34	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C35	10			SI10N750	TCN-10		N750K-100	NT-541		5TCU-Q1
C36	5			SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555		5GA-V5
C37	470			SI470	D6-471	PTE6P1	GP2K-471	UC-5347		5GA-T47 Note 1
C38	.1	600		P688-1	DF-104	PTE6P1		PT601		6TM-P1
C39	220	500								
C40	5			SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555		5GA-V5
C41	39	500		1468-00004		5W5Q4		MC223		1FM-44
C42	39	500		1468-00004		5W5Q4		MC223		1FM-44
C43	.02	600		P688-02	DF-203	PTE6S2		PT612		6TM-S2 Note 5
C44	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5
C45	.02	600		P688-02	DF-203	PTE6S2		PT612		6TM-S2
C46	5000		CMX-10002	BPD-005	MD-502	TM5D5	811-005	DC-525		5HK-D5 Note 5
C47	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521		5HK-D1 Note 2
C48	.004	400		P688-004	D6-402	PTE6D4	GP2-333-402	PT624		6TM-D4
C49	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625		6TM-D5 Note 3
C50	.05	600		P688-05	DF-503	PTE6S5		PT615		6TM-S5
C51	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611		6TM-S1
C52	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611		6TM-S1
C53	.05	600		P688-05	DF-503	PTE6S5		PT615		6TM-S5
C54	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625		6TM-D5
C55	220			SI220	D6-221		GP2K-221	UC-5322		5GA-T22
C56	.25	600								
C57A	.002			P688-002		(PTE6D2		PT622		
B	.005		◆CMX-10012	P688-005	◆PC-100	PTE6D5	◆1405-01	PT625		◆101C1
C	.005			P688-005		PTE6D5		PT625		
C58	.005	600		P688-005		PTE6D5	GP2-333-502	PT625		6TM-D5
C59	.005	600		P688-005		PTE6D5	GP2-333-502	PT625		6TM-D5
C60	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611		6TM-S1
C61	.1	600		P688-1	DF-104	PTE6P1		PT601		6TM-P1

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MECK PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C62	.1	600		P688-1	DF-104	PTE6P1		PT601		
C63	270	500								
C64	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C65	.001	600		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C66	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C67	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C68	.004	400	CPA-14402B							
C69	270	500								
C70	430	500								
C71	430	500								Note 4
C72	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C73	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C74	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C75	56	2000								
C76	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C77	5000			BPD-005	MO-502	TM5D5	811-005	DC-525	5HK-D5	

Note 1. Some Models use 330MMF in this application.
Note 2. Some Models use a .005MFD in this application.
Note 3. Some Models use a .01MFD in this application.
Note 4. Some Models use a 270MMF in this application.
Note 5. Not used in all Models.
◆ Items C57A, C57B, C57C, R70A, R70B, R70C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MECK PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	½	VC-12127D	QJ-246 *	RTV-297	SBBT-682-S	WF13-T251	Contrast-Tapped ⓐ 500Ω-rear
B	250KΩ	2					UR254	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	1.3Meg	½	VC-12132E	QU-138	AG-83-S	AB-69	U-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	50KΩ	½	VC-12131E	QU-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	VCA-12135A	QU-128	AG-49-S	AB-40	SU-41	AGC
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	5000Ω	½	VC-12120C	QU-114	AG-19-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	2.5Meg	½	VC-12121D	QU-239	AG-84-S	AB-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	100KΩ	½	VCA-12135A	QU-128	AG-49-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS Bi7-105X & P1-210 (Panel) Bi3-130 & R2-226 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MECK PART No.	IRC PART No.	NOTES
R8	15KΩ	½			
R9	47KΩ	½		BTS-47K	
R10	100KΩ	½			
R11	150KΩ	½			
R12	1500Ω	½		BTS-1500	
R13	100KΩ	½			
R14	10KΩ	½		BTS-10K	
R15	220KΩ	½		BTS-220K	
R16	10KΩ	½			
R17	15KΩ	½			
R18	2.2Meg	½		BTS-2.2Meg	
R19	2.2Meg	2		BTS-2.2Meg	
R20	8200Ω	2		BTB-8200	Note 2
R21	8200Ω	2		BTB-8200	Note 2
R22	10KΩ	2		BTB-10K	
R23	680Ω	2		BTB-680	Note 3
R24	470Ω	½		BTS-470	
R25	22KΩ	½			
R26	82Ω	½		BTS-82	
R27	100Ω	½		BTS-100	
R28	470Ω	½		BTS-470	
R29	8200Ω	½			
R30	82Ω	½		BTS-82	
R31	100Ω	½		BTS-100	
R32	1Meg	½		BTS-1Meg	
R33	10KΩ	½			
R34	1Meg	½		BTS-1Meg	
R35	180Ω	½		BTS-180	
R36	6800Ω	½			
R37	100Ω	½		BTS-100	
R38	180Ω	½		BTS-180	
R39	100Ω	½		BTS-100	
R40	8200Ω	½		BTS-8200	
R41	33Ω	½		BTS-33	
R42	1000Ω	½		BTS-1000	
R43	220KΩ	½		BTS-220K	
R44	2700Ω	2		BTB-2700	
R45	1800Ω	2		BTB-1800	
R46	100KΩ	½		BTS-100K	
R47	220KΩ	½		BTS-220K	
R48	47KΩ	½		BTS-47K	Note 1
R49	47KΩ	½			
R50	1000Ω	½		BTS-1000	
R51	33KΩ	1			Note 4
R52	1000Ω	½		BTS-1000	
R53	12KΩ	½			
R54	15KΩ	½		BTS-15K	
R55	15KΩ	½		BTS-15K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: MECK PART No.	IRC PART No.	NOTES
R56	10Meg	½		BTS-10Meg	
R57	470KΩ	½		BTS-470K	
R58	180KΩ 5%	½		BTS-180K 5%	
R59	330KΩ 5%	½		BTS-330K 5%	
R60	100KΩ	½		BTS-100K	
R61	220KΩ	½		BTS-220K	
R62	330Ω	1		BTA-330	
R63	18KΩ	½		BTS-18K	
R64	470KΩ	½		BTS-470K	
R65	2.2Meg	½		BTS-2.2Meg	
R66	4700Ω	½		BTS-4700	
R67	47KΩ	½		BTS-47K	
R68	100KΩ	½		BTS-100K	
R69	15KΩ	½		BTS-15K	
R70A	22KΩ	½	◆CMX-10012	BTS-22K	
B	8200Ω	½		BTS-8200	
C	8200Ω	½		BTS-8200	
R71	330KΩ	½		BTS-330K	
R72	33KΩ	½		BTS-33K	
R73	1000Ω	½		BTS-1000	
R74	470KΩ	½		BTS-470K	
R75	680KΩ	½		BTS-680K	
R76	820KΩ	½		BTS-820K	
R77	4700Ω	½		BTS-4700	
R78	2.2Meg	½		BTS-2.2Meg	
R79	560Ω	½		BTS-560	
R80	560Ω	½		BTS-560	
R81	47KΩ	½		BTS-47K	
R82	47KΩ	½		BTS-47K	
R83	100KΩ	½		BTS-100K	
R84	680KΩ	½		BTS-680K	
R85	470KΩ	½		BTS-470K	
R86	47KΩ	½		BTS-47K	Note 5
R87	1500Ω	½		BTS-1500	
R88	5600Ω	½		BTS-5600	
R89	100KΩ	½		BTS-100K	
R90	220KΩ	½		BTS-220K	
R91	1Meg	½		BTS-1Meg	
R92	68Ω	½			
R93	6800Ω	2		BTB-6800	
R94	3900Ω	2		BTB-3900	Note 1
R95	2.2Ω	½			Note 1
R96	8200Ω	½		BTB-8200	
R97	200Ω	10		13/4A-200	
R98	1500Ω	1		BTA-1500	
R99	220KΩ	½		BTS-220K	Note 1

Note 1. Not used in all Models.
Note 2. Some Models may use a single 4100Ω (4 watt) resistor in this application.
Note 3. Some Models may use a 470Ω resistor in this application.
Note 4. Some Models may use a 39KΩ resistor in this application.
Note 5. Some Models may use a 68KΩ resistor in this application.
◆ Items R70A, R70B, R70C, C57A, C57B, C57C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ⓐ1.6A	730VCT .190ADC	5VAC ⓐ 3A	6.3VAC ⓐ 1.2A SEC. 4 6.3VAC ⓐ 6.3A	TPC-10011	P-8163 ①	P-3078	TP-360 ①	R-37BC	201T10

① Drill new mounting holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	359Ω tap ⓐ 24Ω	10Ω tap ⓐ .5Ω, 7.3Ω SEC. 2 2.5Ω SEC. 3 0Ω	THC-10017-C						Horiz. Output Trans.
T3	1080Ω tap ⓐ 10.6Ω		TOB-10045H	A-8123	A-3037	TSO-8	A-102X		Vert. Output Trans.
T4A	16Ω		TDB-10001C	DY-92A ①	MDF-70	TY-5	Y-21 ②		Horiz.Deflection Coils
B	61Ω								Vert. Deflection Coils
T5	.4Ω		TO-10023C	WC-1	MWC-2 ③	TW-1			Width Coil

① Use original horizontal deflection coil network if necessary.
② Use original horizontal deflection coil network.
③ Enlarge mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: MECK PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	5.1KΩ	3.5Ω	340Ω	.52Ω	TOC-10034	A-3877①	A-2930 ①	RO-9 ①	S-3X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: MECK PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	10"	PM	3.5Ω	SRC-10024A	10J11	10A31	① Alternate Speaker
B	8"	PM	3.5Ω	SRC-10025 ①	8J9	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: MECK PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neutr. Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st. Video IF	1Ω						
L8	RF Choke	1.3Ω						
L9	2nd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1062		6250	
L10	Fil. Choke	0Ω		LGA-10019A	19-3001	TV-189	6175	
L11	3rd. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063		6249	
L12	4th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1063		6249	
L13	5th. Video IF	.1Ω	.1Ω	TSA-10054B	17-1064		6250	
L14	Series Peaking Coil	7Ω		LGA-10032	19-3125		6153	120 Microhenries
L15	Shunt Peaking Coil	9Ω		LGA-10033	19-3180	TV-184	6180	180 Microhenries
L16	Series Peaking Coil	8.5Ω		LGA-10034	19-3093	TV-181	6177	100 Microhenries
L17	Sound IF	1.8Ω		TSA-10050C	17-3400	TV-151	1470	
L18	Ratio Det.	1Ω	.3Ω CT	TSA-10062A	17-1033	TV-110	1468	Tertiary Winding-.25Ω
L19	Horiz. Osc.	65Ω		LGA-10017B	19-1576	TV-163	6210	

FUSES

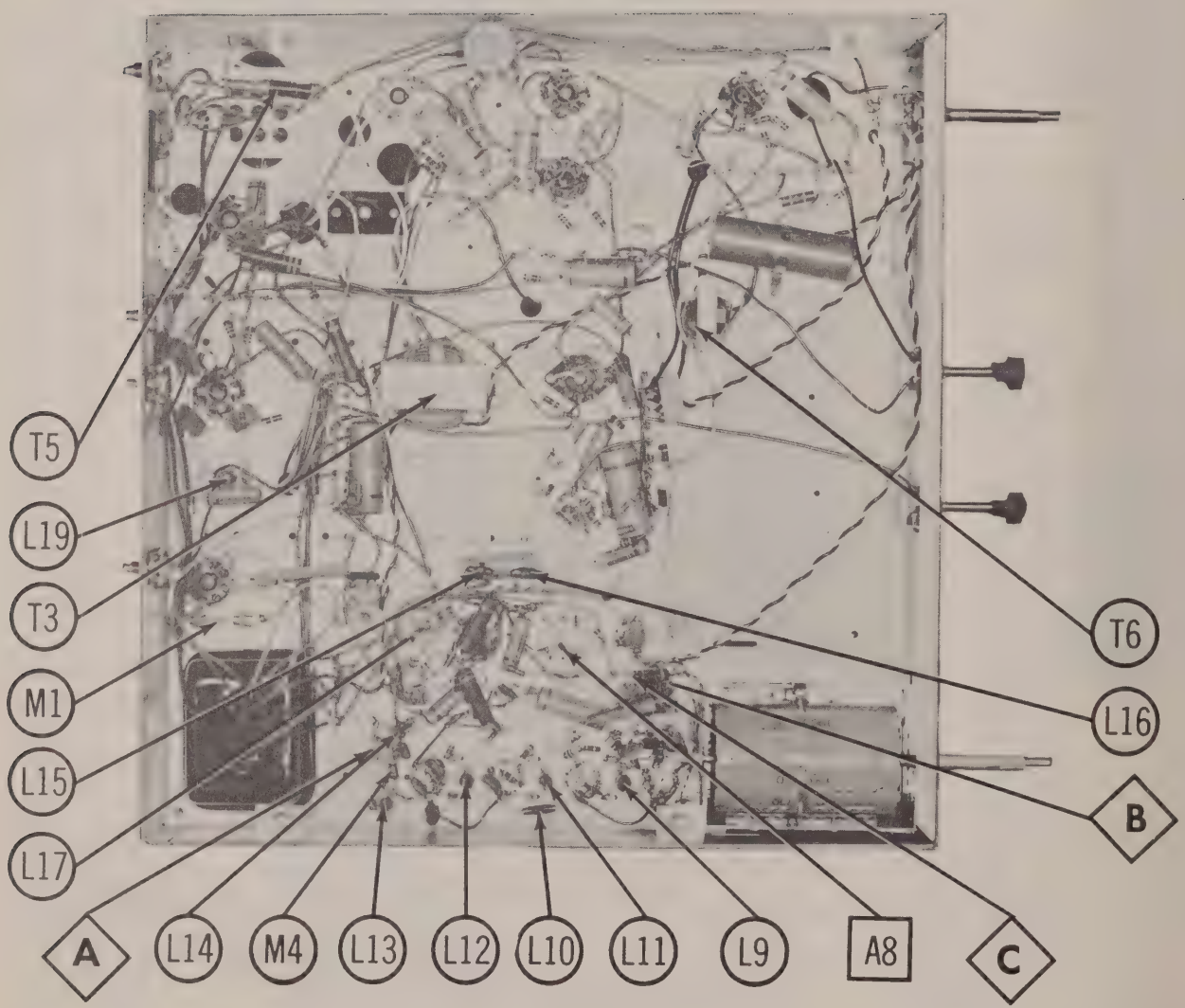
ITEM No.	TYPE	RATING	REPLACEMENT DATA: MECK PART No. FUSE	MECK PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG (B/B)	1/2 A. 125V.			313.500 (3AG - ½A. B/B)	121002 (3 Used)	MDL 1/2	4592 (2 used)
M2 *	3AG	5 A. 250V.			312005 (3AG -5A.)	341001	MTH5	HKP

* Not used in all Models.

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	MECK PART No.	NOTES
M3	RF Tuner	TT-10012	
M4	Crystal Diode		Video Detector (1N60)
M5	Centering Magnet	MDA-10002	
M6	Ion Trap	1TA-10003	
B2	Trimmer Cap.	CTA-10005	Horiz. Drive, 25-280MMF



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENT.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TROUBLE SHOOTING AIDS (CONT.)

VIDEO

SOUND BARS

Check by substitution A6 (4.5MC Trap). Check setting of local oscillator and alignment of video IF stages.

POOR RESOLUTION

Check alignment of tuner and IF stages. Substitute V7 and check associated components.

SMEAR

Substitute V7 and check circuit components.

ONE WIDE BLACK BAR ACROSS PICTURE

Check tuner, video IF and video amplifier for filament to cathode leakage. Check tube sockets for same thing.

POOR CONTRAST

Check waveform W1;

If Unsatisfactory	If Satisfactory
Check alignment of video IF and tuner. Check associated components.	Check waveform W2.

Check waveform W2,

If Unsatisfactory	If Satisfactory
Substitute V7 and check associated components.	Check picture tube grid components. Check picture tube.

AUDIO

WEAK OR NO SOUND

Substitute V8, V9, V10 and V11. Check alignment of sound and video IF.

BUZZ

Adjust ratio detector secondary for minimum buzz. Substitute V9 . Check local oscillator setting. Check for overloading at waveform W1. If overloated exists, check AGC network.

DISTORTED

Check audio stages using audio signal generator and scope.

If Undistorted	Distorted
Check alignment of sound IF and ratio detector.	Substitute V10, V11 . Check circuit components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check waveform W15;

If Unsatisfactory	If Satisfactory
Substitute V15 and check circuit components particularly L19.	Substitute V16, V17 and V18. Check T2, T4A , T5 and associated components.

WEAK HIGH VOLTAGE

If substitution of V15, V16, V17 and V18 does not correct trouble, follow procedure outlined under "LOSS OF HIGH VOLTAGE".

BLOOMING

If substitution of V15, V16, V17, V18 and V19 does not correct trouble, follow procedure outlined under "LOSS OF HIGH VOLTAGE".

POWER

SMALL RASTER

Substitute V19 and check filter components. Check B+ circuit for shorts.

DIM PICTURE

Substitute V19 and check B+ components.

GENERAL

NO PICTURE NO SOUND NO SNOW

Substitute V2 and V7. Check associated components.

WEAK PICTURE AND WEAK SOUND

Substitute V3, V4 and V5. Check video IF alignment.

SOUND WITH WEAK PICTURE

Substitute V1 and check tuner alignment and components.

RECEIVER INOPERATIVE

Substitute V19. Check 1/4 Amp fuse holder under chassis. Check B+ components.

The Trouble-Shooting photographs shown are made with permission of transmitting station WFBM-TV and in no way reflect the quality of the transmitted picture. Similarly, symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the RF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

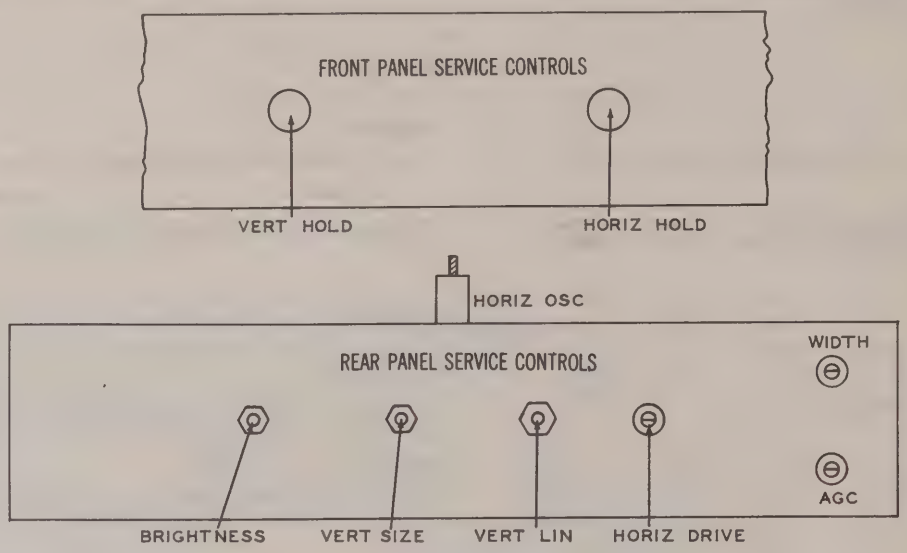
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass , remove three wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AGC CONTROL ADJUSTMENT

Tune receiver to strongest TV station available. Set contrast control fully clockwise and adjust AGC control clockwise as far as possible without distortion or instability of picture.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on top of chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L19) until, picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector buzz, adjust the ratio detector secondary (L18) located on bottom of chassis. (See tube placement chart).

FUSES

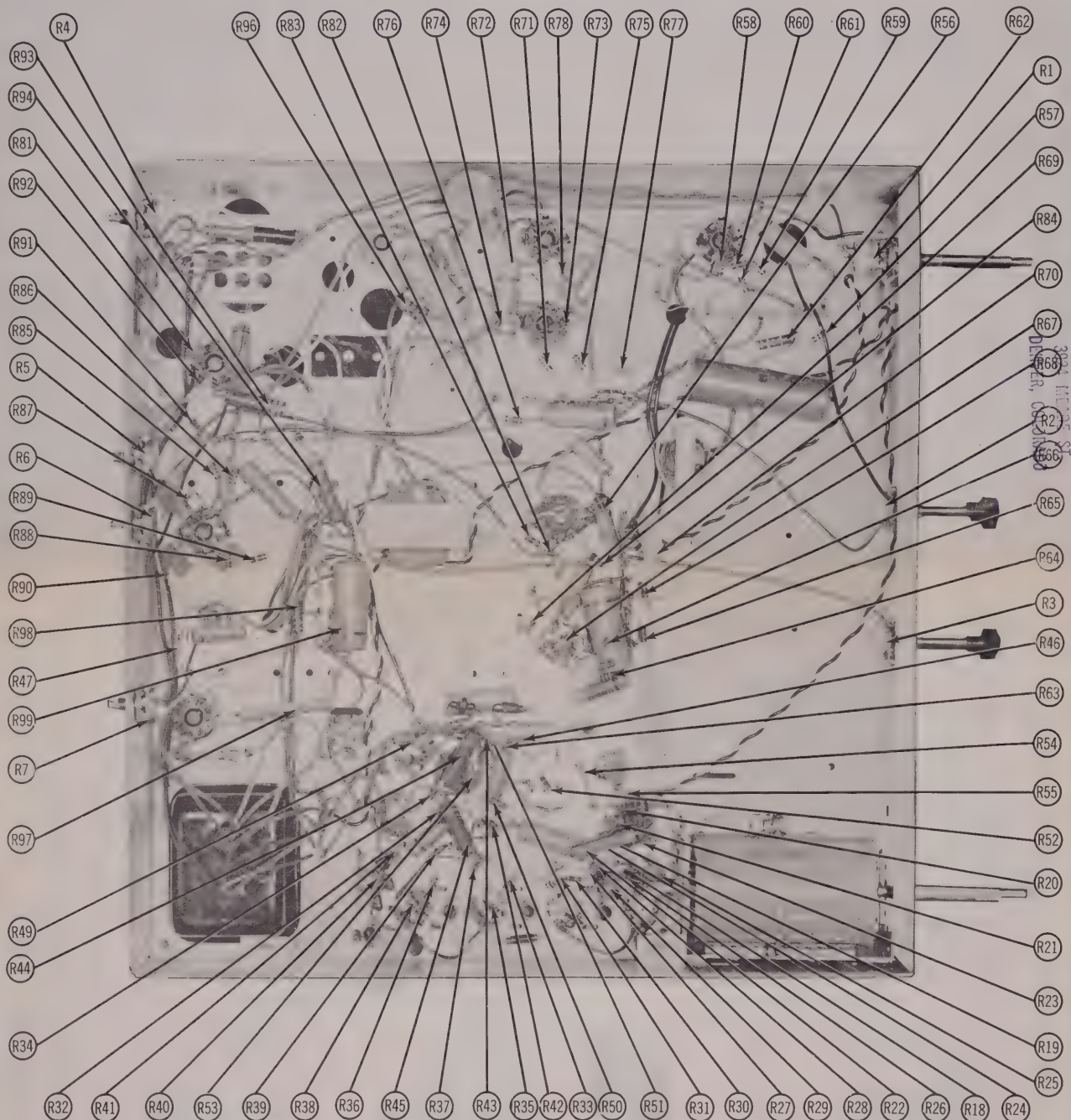
One fuse is used for LV Power Supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting a magnetic ring around the neck of the picture tube located flush against the yoke. Turn the dish like knob and at the same time rotate the ring around the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

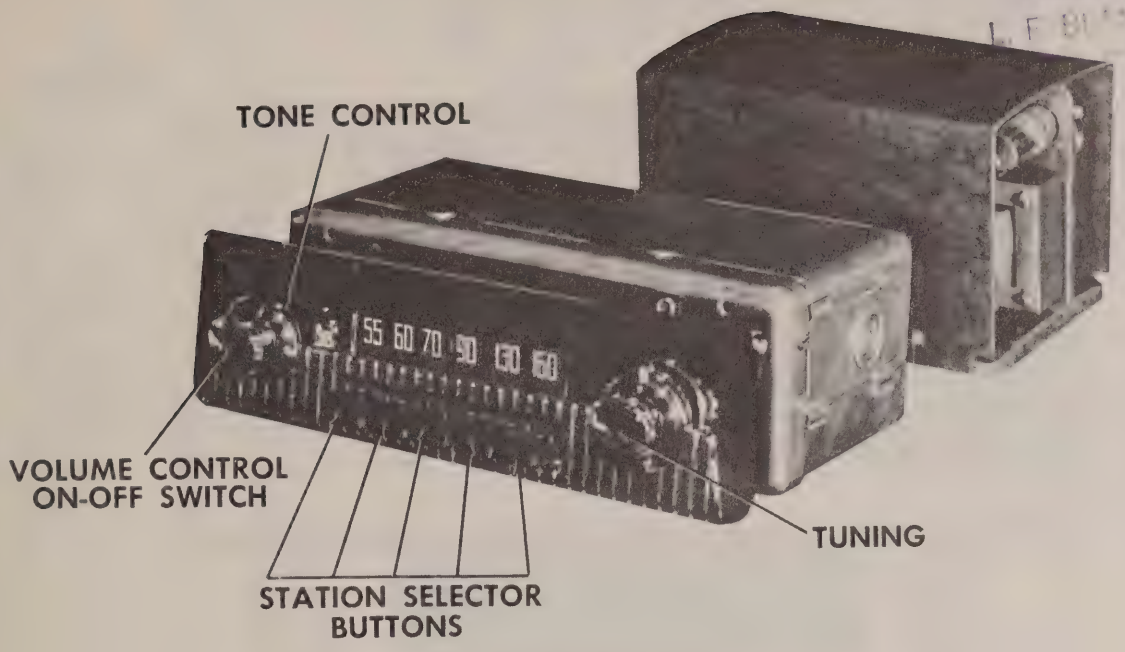
1. Remove 4 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in antenna. Remove 2 wood screws. Remove antenna bracket.
4. Disconnect speaker. Remove 2 speaker nuts. Remove speaker. (Not necessary for chassis removal.)
5. Remove 1 wood screw from CRT support.
6. Remove 4 chassis bolts. Remove chassis.



CHASSIS BOTTOM VIEW- RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3894 MEADE ST
DENVER, COLORADO

PROPERTY OF
L. F. BLANKENSHIP



MOPAR
MODEL 610T

MOPAR
MODEL 610T

TRADE NAME	Mopar Model 610T (For 1953 Dodge Trucks - Series B-3 & B-4)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Custom Built Superheterodyne Automobile Receiver
TUBES (Six)	Types 6BD6 RF Amp., 6BE6 Conv., 6BD6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volts Storage Battery — RATING 5.4 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Remove dial scale assembly for tuning core adjustments.
Set tone control to maximum clockwise position.
Before performing step 2, tuner cores should be backed out to project 1 5/8" from end of coil forms so they will have no effect on trimmer adjustment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~Mod)	Extreme high frequency end of dial.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	Fig. 1	High side thru dummy antenna to antenna receptacle. Low side to chassis.	1610KC	"	"	A5, A6, A7	Adjust for maximum output in order indicated.
3.	"	"	1300KC	See remarks	"	A8, A9, A10	With tuning knobs, move core carriage in 5/16" from position in step 2. Adjust for maximum output in order indicated.
4.	"	"	1610KC	Extreme high frequency end of dial	"	A5, A6, A7	Adjust for maximum output in order indicated.
5.	"	"	1300KC	Tune to 1300KC signal	"		Check pointer position. If necessary bend pointer to coincide with 1300KC on dial.
6.	With receiver installed in car and antenna fully extended tune to a weak signal around 1400KC and adjust A7 for maximum volume.						

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BD6	6BD6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BD6	6BD6	7BK	
V4	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	350	23A473015	AFH3-169		CO31		FP331	TVL-3620	
B	▲30	300								
C	20	25								
C2	.05	100	8R13514	P288-05	DF-503	PJ2S5		PT415	2TM-S42	
C3	90		21A591682							
C4	.006	100	8A4529	P285-006		PTE6D6	GP2-333-602	PT626	6TM-D6	
C5	470	500	21R6673	1469-0005		5R5T5		MC245	5GA-T47	
C6	5		21K70720	SI5	TCZ-4.7		GP1K-050	ZT-555	5GA -V5	
C7	47		21K592375							
C8	220									
C9	.05	400	8R14791	P485-05	DF-503	PTE4S5		PT415	4TM-S5	
C10	27		21R410089	SI27	D6-270		GP1K-270	UC-5427	5GA-Q27	
C11	.01	200	8R23053	P285-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C12	.002	400	8R4736	P488-002	D6-202	PTE6D2	GP2-333-222	PT622	6TM-D2	
C13	.02	400	8K120193	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C14	.02	400	8R12699	P488-02	DD-203	PTE4S2		PT412	4TM-S2	
C15	.006	400	8K71910	P488-006	D6-602	PTE6D6	GP2-333-602	PT626	6TM-D6	
C16	.02	1000	8K114137	P1088-02		PTE16S2		PT1612	MB-S2	
C17	.5	100	8K17028	VHC36		MP2P5		RF480	68P20	
C18	.5	100	8K17028	VHC36		MP2P5		RF480	68P20	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	100KΩ	½	18K512740	QJ-406A *			UF15L	Tone-Panel
B	250KΩ	½					UR254-T753	Volume-Tapped @ 75KΩ-rear
C	Switch						US-26	Attach to R1B

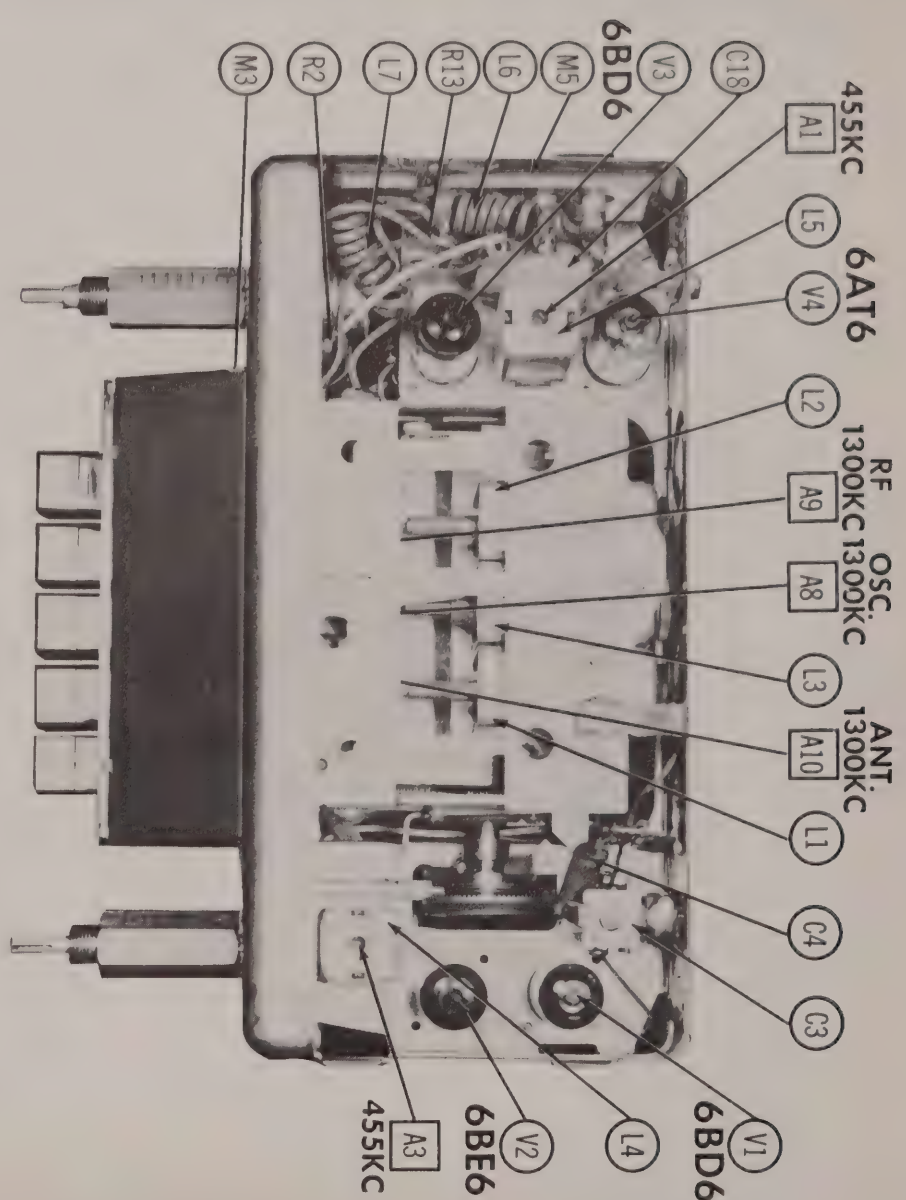
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-128 & P1-200 (Panel) B18-130X & R1-216 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	680Ω	½	6R6040	BTS-680	
R4	18KΩ	½	6R5591	BTS-18K	
R5	33KΩ	½	6R6012	BTS-33K	
R6	6800Ω	2	6R5690	BTB-6800	
R7	330Ω	½	6R6022	BTS-330	
R8	1Meg	½	6R6004	BTS-1Meg	
R9	47KΩ	½	6R6056	BTS-47K	
R10	47KΩ	½	6R6056	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R11	1Meg	½	6R6004	BTS-1Meg	
R12	2.2Meg	½	6R3927	BTS-2.2Meg	
R13	2700Ω	½	6R5577	BTS-2700	
R14	100KΩ	½	6R6031	BTS-100K	
R15	220KΩ	½	6R6015	BTS-220K	
R16	270Ω	½	6R6432	BTS-270	
R17	3900Ω	2	6R476012	BTB-3900	
R18	56Ω	½	6R5614	BTS-56	
R19	56Ω	½	6R5614	BTS-56	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6.3VAC @ 3A	480VCT .043ADC			25K512083		P-3068	VT-1 ①	V-16K ①

① Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	7.3KΩ	3.6Ω	654Ω	.73Ω	25B502330	A-3878 ①	A-2931 ①	RO-13 ①	S-7X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6 x 9"	PM	3.6Ω	50C513193 50C513544 ① 50C513195 ① 50C513197 ① 50C513200 ①	ST-810 Mod. P69-V	69A2	① Alternate 6 x 9" speakers

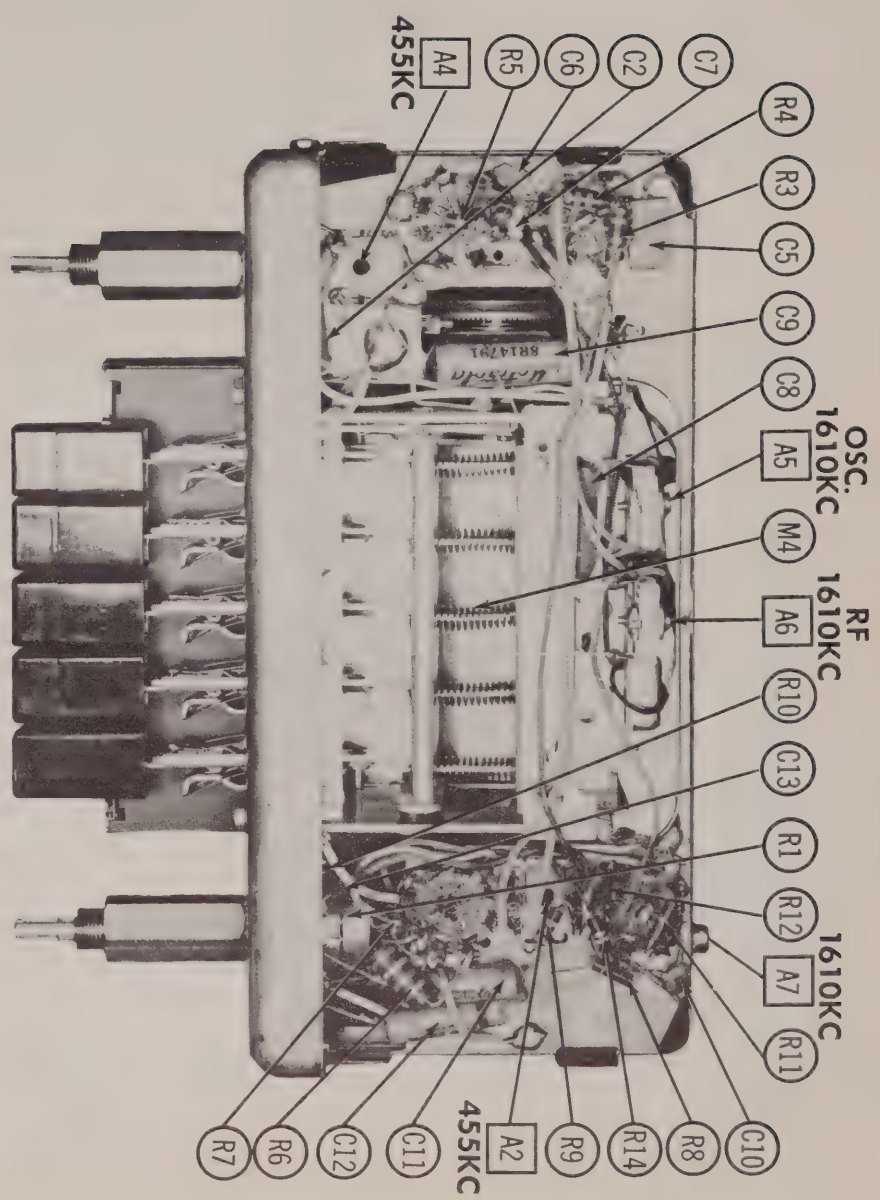
COILS (RF-IF)

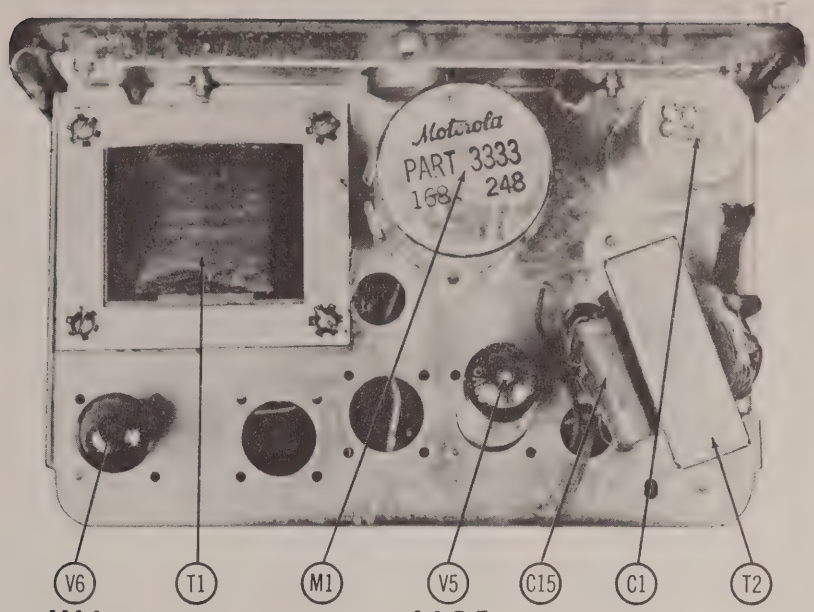
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	1Ω		24B520694				Less core, core part #24B520693
L2	RF Coil	1Ω		24K520695				Less core, core part #24B520693
L3	Osc. Coil	.8Ω	4.3Ω	24B520693				Lesscore, core part #24B520693
L4	Input IF	18Ω	18Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	18Ω	18Ω	24K485555	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K592269				
L7	Fil. Choke	0Ω		24K592269				
L8	Vibrator Hash Choke	.1Ω		24A512119				47 Microhenries

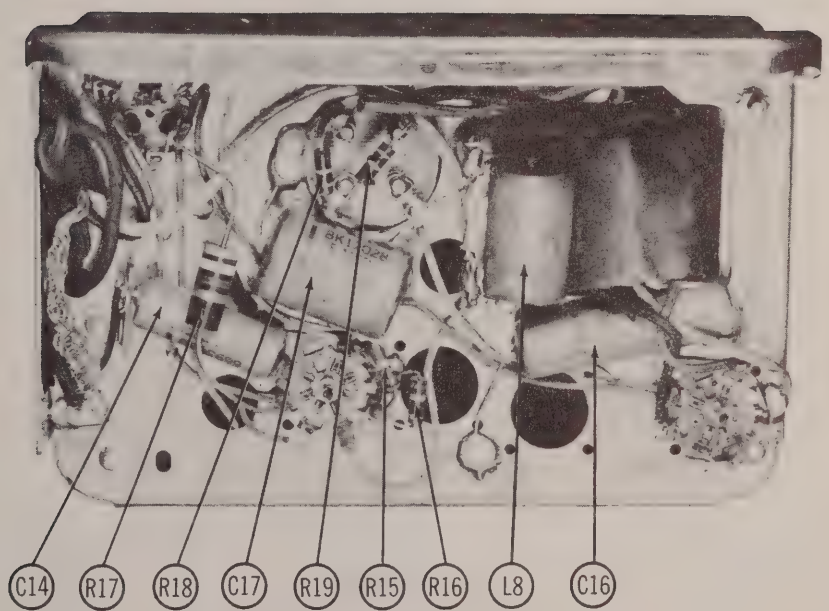
VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3V	115~	48B3333	5342	859	5342	

CHASSIS—BOTTOM VIEW




Motorola
PART 3333
168 248
V6
T1
M1
V5
C15
C1
T2
6X4
6AQ5


C14
R17
R18
C17
R19
R15
R16
L8
C16

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MOTOROLA PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	SFE	14 Amp.	65K12894	9K521895 (Includes fuse and leads)	307014 (SFE-14A)	155014	SFE 14	HR1 (Includes fuse and leads)

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Dial Light	65X10867	Type #44
M4	RF Tuner	AT-94	Complete
M5	Spark Plate & Receptacle Assy.	1B512202	
A5	Trimmer Cap.	20A77537	Osc. Adj. (50-280MMF)
A6	Trimmer Cap.	20A77537	RF Adj. (50-280MMF)
A7	Trimmer Cap.	20A513232	Ant. Adj. (20-180MMF)
	Pointer Assy.	1V512211	
	Dial Scale	34B521338	
	Knob	1B521969	Vol., Tuning
	Knob	36B521973	Tone
	Knob	36K521975	Dummy on tuning shaft

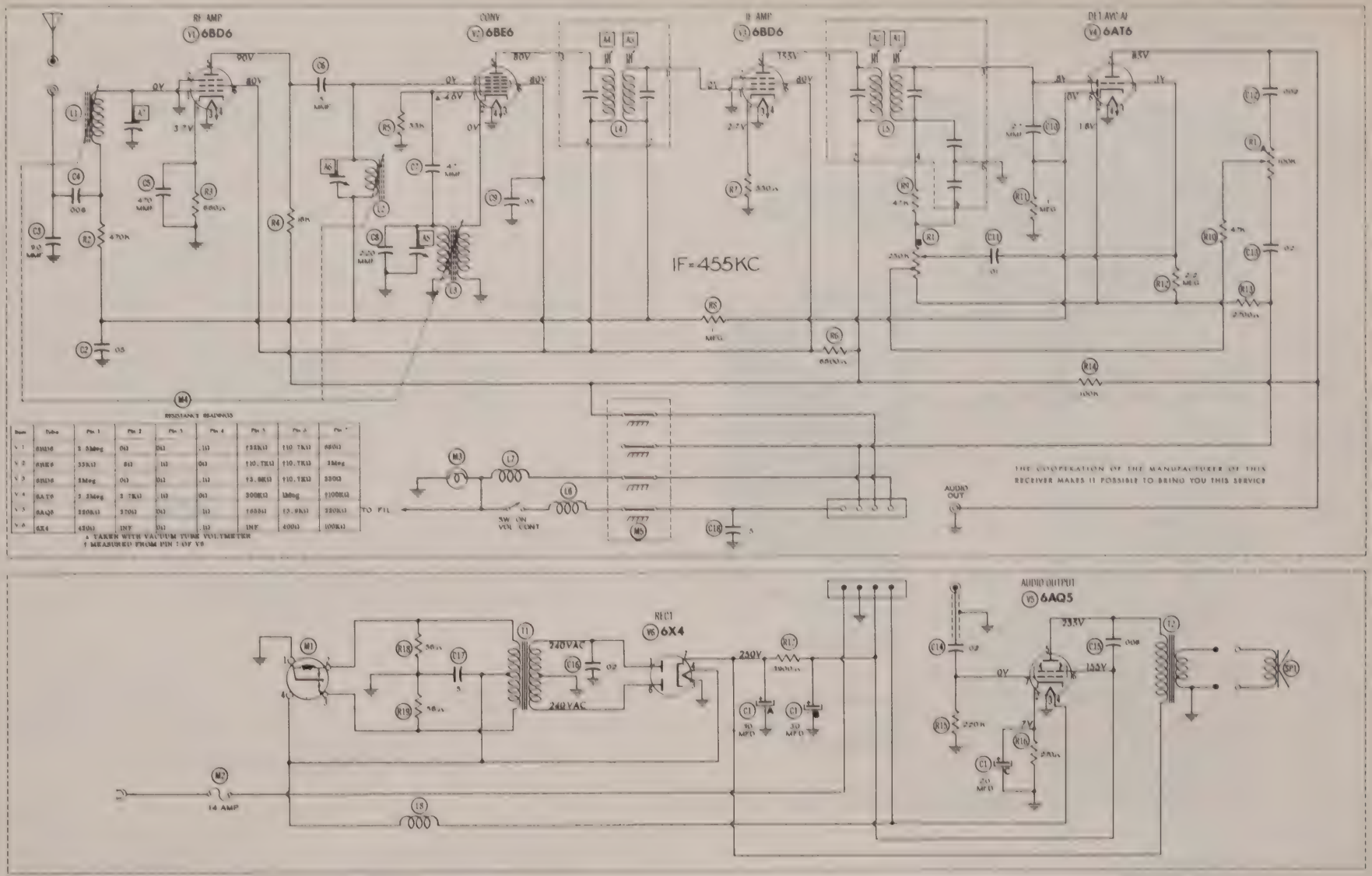
PUSH BUTTON ADJUSTMENT

Pull out push button to release.

Tune manually to desired station.

Press push button all the way in.

Repeat above precedure for remaining push buttons.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BD6	2.5Meg	0Ω	0Ω	1Ω	725KΩ	110.7KΩ	680Ω
V 2	6BE6	35KΩ	0Ω	1Ω	0Ω	110.7KΩ	110.7KΩ	2Meg
V 3	6BD6	2Meg	0Ω	0Ω	1Ω	73.8KΩ	110.7KΩ	330Ω
V 4	6AT6	2.5Meg	2.7KΩ	1Ω	0Ω	300KΩ	1Meg	100KΩ
V 5	6AQ5	250KΩ	270Ω	0Ω	1Ω	165KΩ	12.9KΩ	250KΩ
V 6	6X4	450Ω	INF	0Ω	1Ω	INF	400Ω	100KΩ

* TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 1 OF V6

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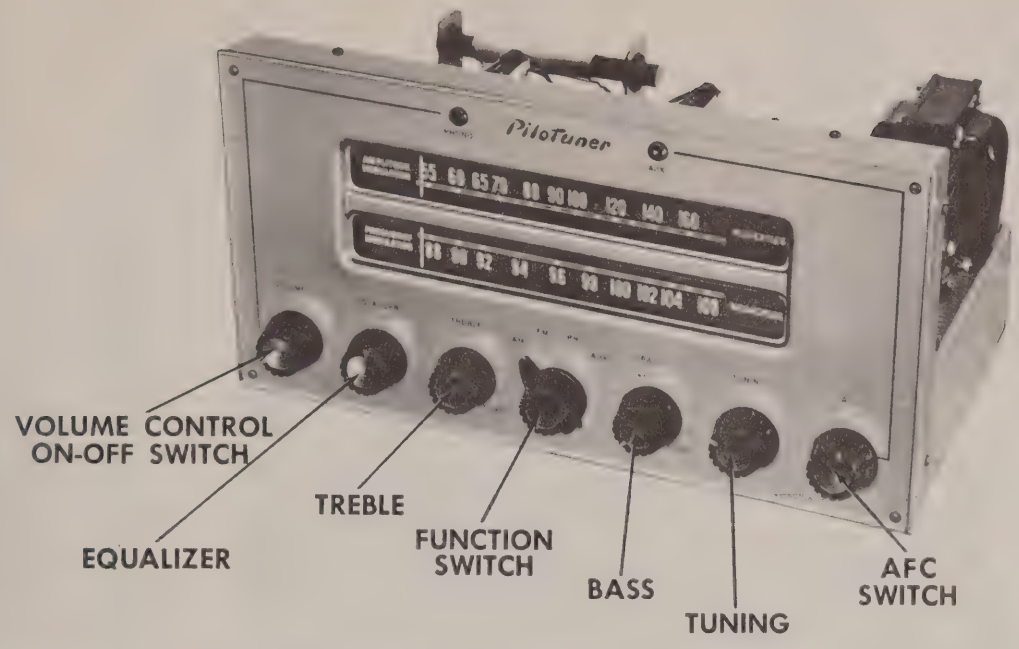
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

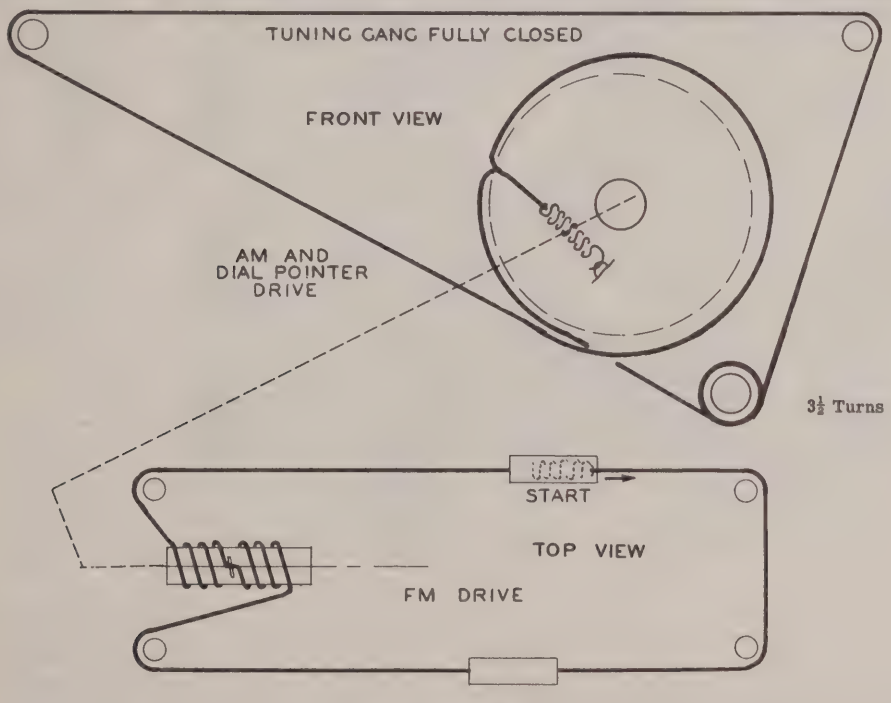
PROPERTY OF
L. F. [illegible]

PILOT
MODEL AF-824



PILOT
MODEL AF-824

TRADE NAME	Pilot Model AF-824		
MANUFACTURER	Pilot Radio Corp., 37-06 36th. St., Long Island City, N.Y.		
TYPE SET	AC Operated AM-FM Tuner for Custom Installation		
TUBES (Ten)	Types 6BA6 RF Amp., 6U8 Conv., 6AB4 AFC, 6BA6 FM AM IF Amp., 6AU6 FM IF Amp.-AM Det., 6AL5 Ratio Det., 12AU7 Cath. Follower, 12AT7 AF Amp., 12AX7 Phono Pre-Amp. 6X5GT Rectifier		
POWER SUPPLY	105-120 Volts AC-60 Cycles	RATING	.16 Amp. @ 117 Volts AC
TUNING RANGE-BROADCAST	540-1700KC	FREQ. MOD.	88-108MC



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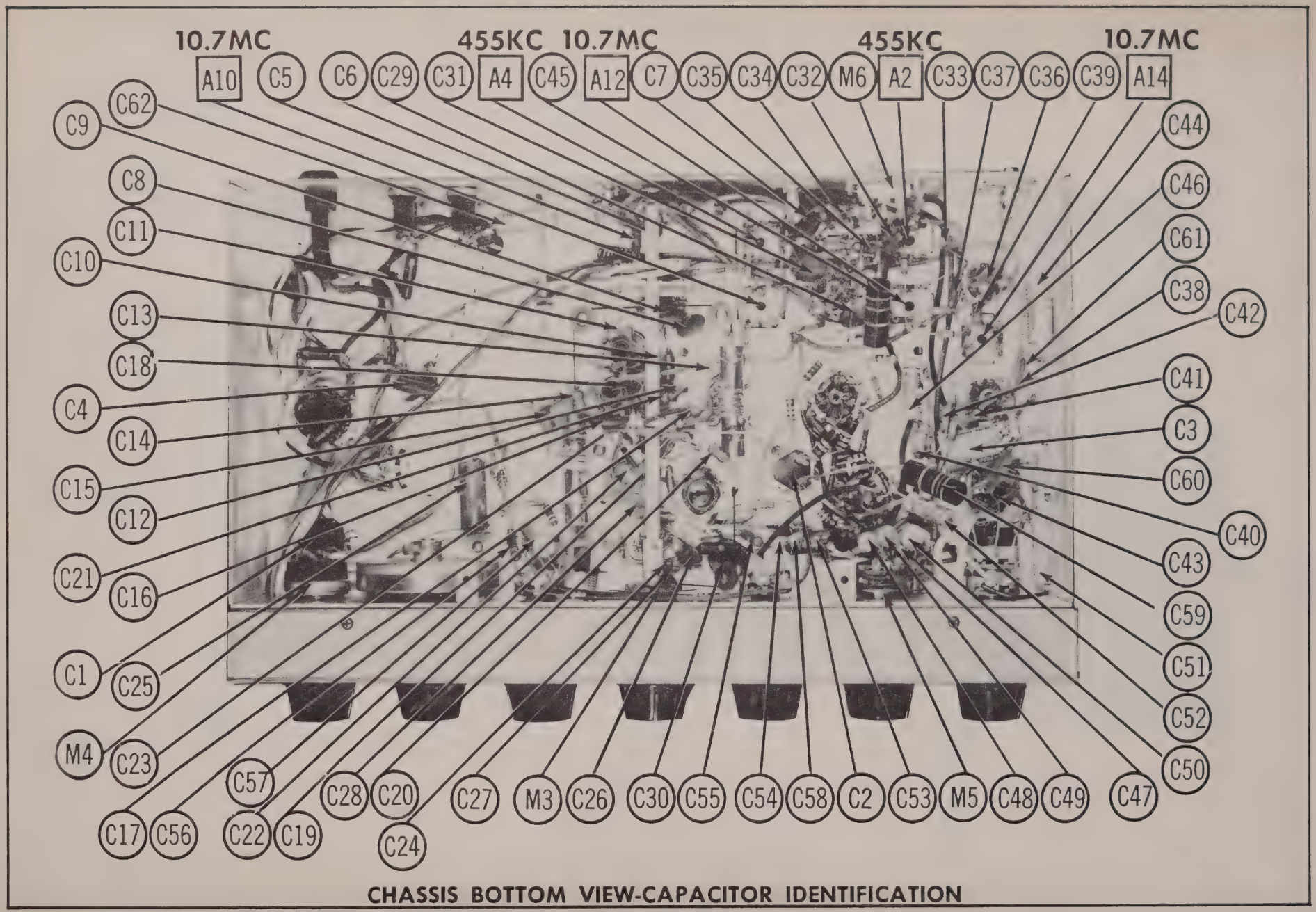
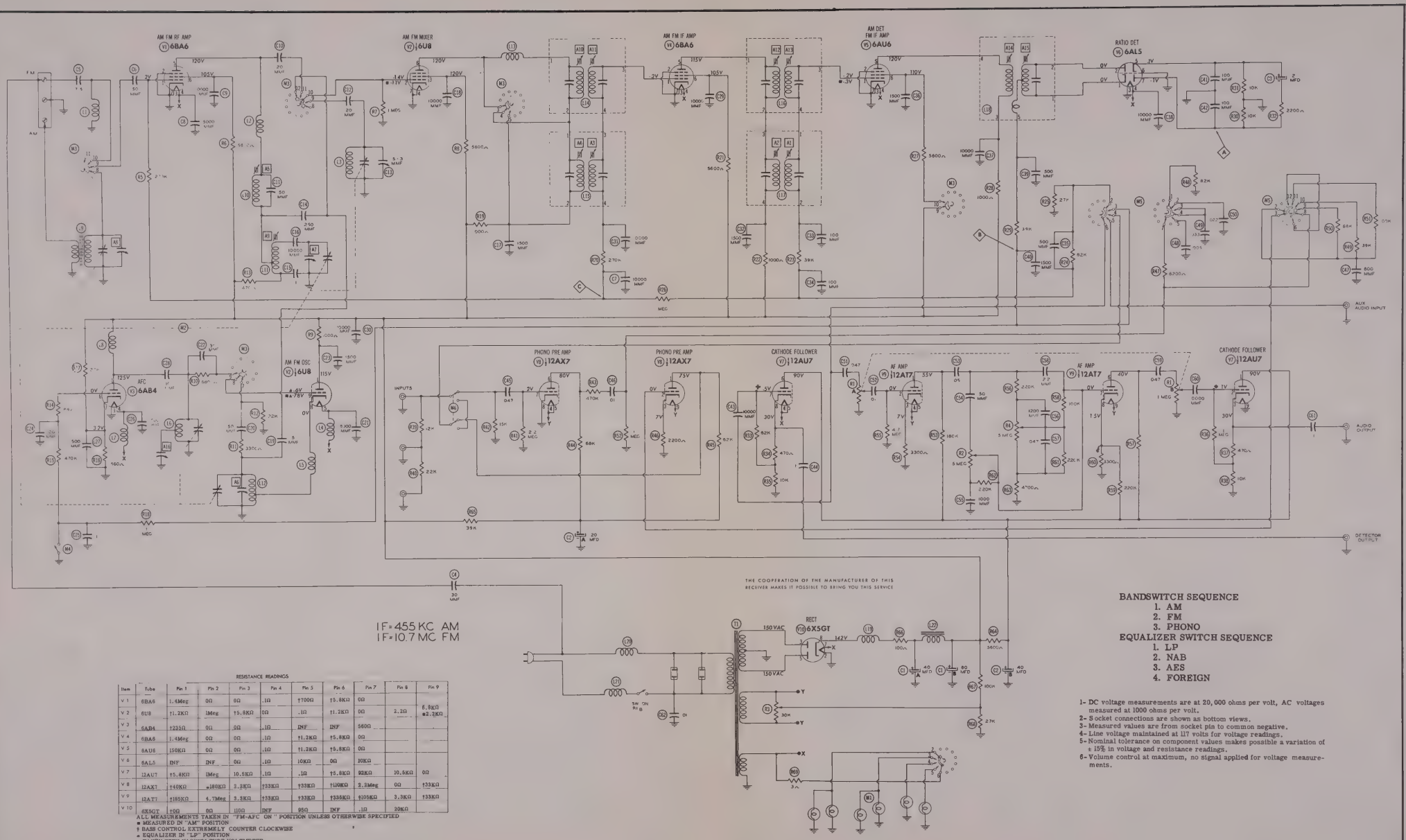


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION


AM FM RF AMP V1 6BA6
AM FM MIXER V2 6U8
AM FM IF AMP V4 6BA6
AM DET FM IF AMP V5 6AU6
RATIO DET V6 6AL5
AM FM OSC V2 6U8
AFC V3 6AB4
PHONO PRE AMP V8 12AX7
PHONO PRE AMP V9 12AX7
CATHODE FOLLOWER V7 12AU7
AF AMP V5 12AT7
AF AMP V9 12AT7
CATHODE FOLLOWER V7 12AU7
RECT V10 6X5GT
INPUTS
AUX AUDIO INPUT
AUDIO OUTPUT
DETECTOR OUTPUT
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

IF=455 KC AM
IF=10.7 MC FM

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BA6	1.4Meg	0Ω	0Ω	.1Ω	†700Ω	†5.8KΩ	0Ω		
V 2	6U8	†1.2KΩ	1Meg	†5.8KΩ	0Ω	.1Ω	†1.2KΩ	0Ω	2.2Ω	5.8KΩ ▪2.2KΩ
V 3	6AB4	†233Ω	0Ω	0Ω	.1Ω	INF	INF	560Ω		
V 4	6BA6	1.4Meg	0Ω	0Ω	.1Ω	†1.2KΩ	†5.8KΩ	0Ω		
V 5	6AU6	150KΩ	0Ω	0Ω	.1Ω	†1.2KΩ	†5.8KΩ	0Ω		
V 6	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	10KΩ		
V 7	12AU7	†5.8KΩ	1Meg	10.5KΩ	.1Ω	.1Ω	†5.8KΩ	92KΩ	10.5KΩ	0Ω
V 8	12AX7	†40KΩ	▪180KΩ	2.2KΩ	†33KΩ	†33KΩ	†100KΩ	2.2Meg	0Ω	†33KΩ
V 9	12AT7	†185KΩ	4.7Meg	3.3KΩ	†33KΩ	†33KΩ	†335KΩ	4105KΩ	3.3KΩ	†33KΩ
V 10	6X5GT	†0Ω	0Ω	110Ω	INF	95Ω	INF	.1Ω	20KΩ	

ALL MEASUREMENTS TAKEN IN "FM-AFC ON" POSITION UNLESS OTHERWISE SPECIFIED
▪ MEASURED IN "AM" POSITION
† BASS CONTROL EXTREMELY COUNTER CLOCKWISE
▲ EQUALIZER IN "LP" POSITION
♦ TAKEN WITH VACUUM TUBE VOLTMETER
‖ MEASURED FROM PIN 5 OF V7.
MEASURED FROM PIN 8 OF V7.

BANDSWITCH SEQUENCE
1. AM
2. FM
3. PHONO

EQUALIZER SWITCH SEQUENCE
1. LP
2. NAB
3. AES
4. FOREIGN

1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

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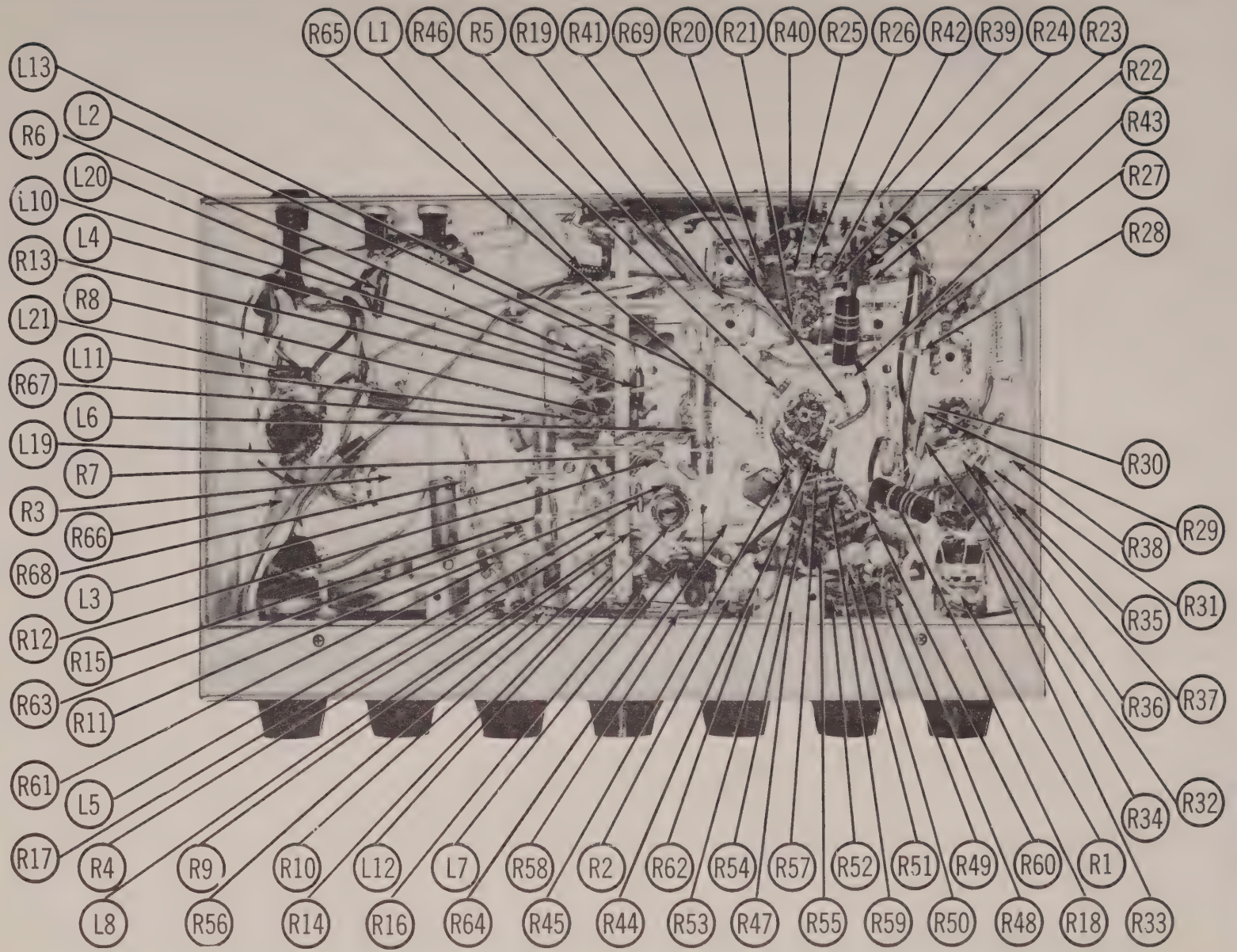
220-6



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PILOT
MODEL AF-824

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Allow tuner warm up period of 30 minutes before making any adjustments. Before starting alignment check to see if the FM oscillator capacitor (across L6) and the FM RF capacitor (across L3) are fully engaged when the tuning gang is fully closed. If necessary, these capacitors may be set to their proper position by the dial cord adjustment screw.

AM ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to AM antenna terminal. Low side to chassis.	455KC (400∿Mod)	AM	Tuning gang fully closed.	DC probe to point Ⓒ Common to chassis.	A1, A2, A3, A4	Adjust for maximum deflection.
2.	200MMF	High side thru 200MMF to AM antenna terminal. Low side to chassis.	"	"	"	"	A5	Adjust for MINIMUM deflection.
3.	"	"	1500KC	"	1500 MC	"	A6, A7, A8	Adjust for minimum deflection while rocking gang.
4.	"	"	600KC	"	600 MC	"	A9	"
5.	Repeat steps 3 and 4 if necessary.							

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Switch AFC to "Off" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to FM antenna terminal. Low side to chassis.	10.7MC	FM	88MC	DC probe to point Ⓐ Common to chassis.	A10, A11, A12, A13, A14	Adjust for maximum deflection.
7.	"	"	"	"	"	DC probe to point Ⓑ Common to chassis.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
6.	.01MFD	High side to FM antenna terminal. Low side to chassis.	10.7MC (450KC Swp)	FM	88MC	High side to point Ⓐ. Low side to chassis.	A10, A11, A12, A13, A14	Disconnect stabilizing capacitor C3. Adjust for maximum amplitude and symmetry with 10.7MC occuring at center of response curve. See Fig. 1.
7.	"	"	"	"	"	High side to point Ⓒ. Low side to chassis.	A15	Reconnect stabilizing capacitor C3. Adjust so that 10.7MC falls at the center of the crossover lines as in Fig. 2. Retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Switch AFC to "Off" position.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon Resistors	High side to FM antenna terminal. Low side to chassis.	90MC	FM	90 MC	DC probe to point Ⓐ Low side to chassis.	L6, L3	Adjust by compressing or expanding coil turns. Adjust for maximum deflection while rocking tuning gang.
9.	"	"	106MC	"	106 MC	"	A16, A17	Adjust for maximum deflection while rocking tuning gang.
10.	"	"	98MC	"	98 MC	"	L1	Adjust by compressing or expanding coil turns. Adjust for maximum deflection while rocking tuning gang.
11.	Repeat steps 8, 9 and 10 if necessary.							

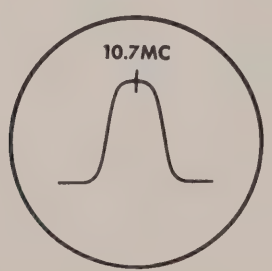


FIG. 1

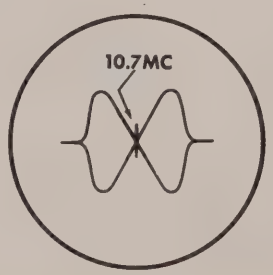


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

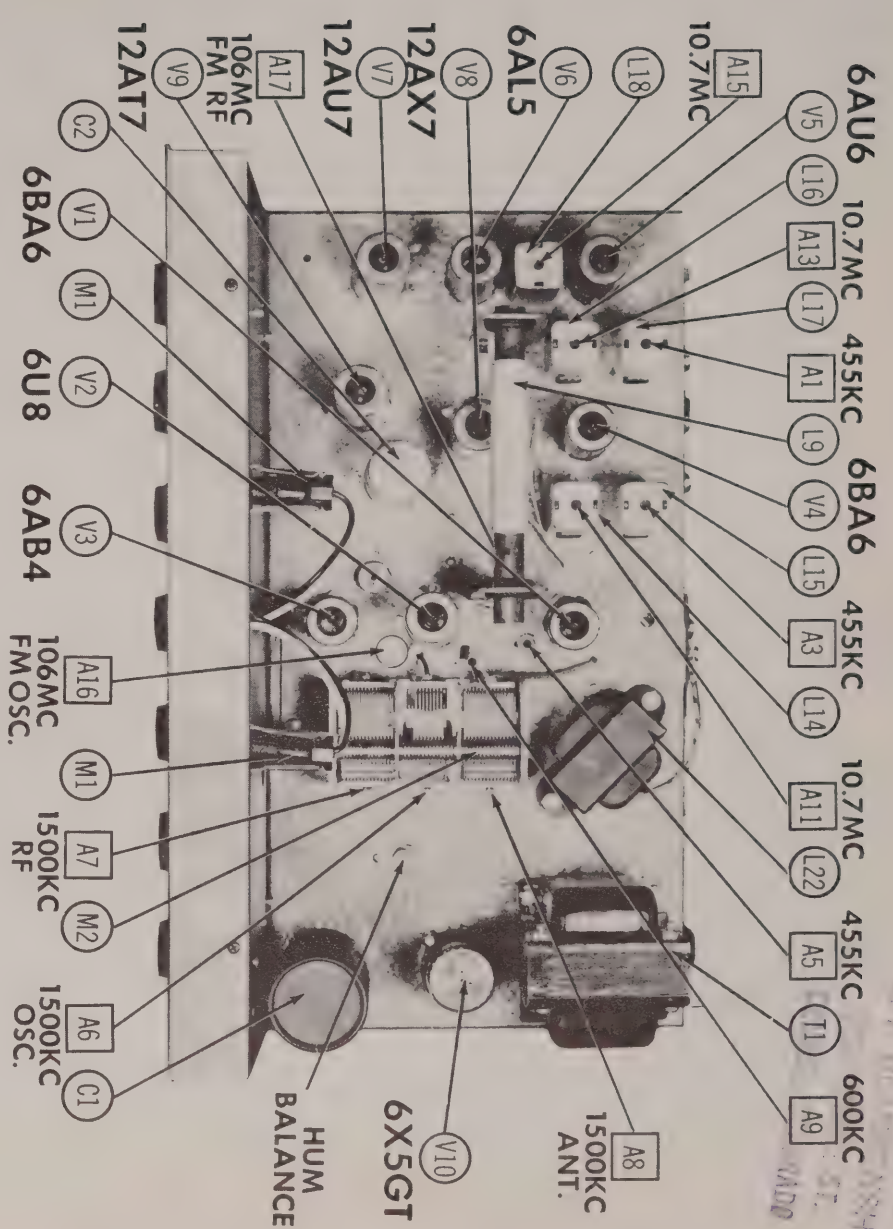
ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		PILOT PART No.	STANDARD REPLACEMENT		
V1	FM AM RF Amp.	6BA6	6BA6	7BK	
V2	FM AM Converter	6U8	6U8	9AE	
V3	AFC	6AB4	6AB4	5CE	
V4	FM AM IF Amp.	6BA6	6BA6	7BK	
V5	FM IF Amp.- AM Detector	6AU6	6AU6	7BK	
V6	Ratio Detector	6AL5	6AL5	6BT	
V7	Cathode Follower	12AU7	12AU7	9A	
V8	Phono Pre-Amp.	12AX7	12AX7	9A	
V9	AF Amplifier	12AT7	12AT7	9A	
V10	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTE
	CAP.	VOLT	PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	250		AFH2-64		BO48		FP266	TVL-2582	
B	▲80	250								
C2A	■20	250		AFH2-28		BO23		FP230	TVL-3540	
B	▲40	250								
C3	2	50		PRS150/4		BBR2-50T		TC302	TVA-1301	
C4	30	1000								
C5	7.5								5GA-V75	
C6	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C7	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C8	5000			BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C9	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C10	20			SI20	D6-200		GP1K-200		5GA-Q2	
C11	50			SI50NP0	TCZ-50		NP0-333-500	ZT-545	5TCC-Q5	
C12	20			SI20	D6-200		GP1K-200		5GA-Q2	
C13	.5-3				829-3			CT-565		
C14	250			SI250	D6-251		GP2K-251	UC-5325	5GA-T25	
C15	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C16	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C17	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C18	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C19	5			SI5N750	TCN-5		N750K-050	NT-555	5TCU-V5	
C20	50			SI50	D6-500	TM5Q5	GP1K-500	UC-535	5GA-Q5	
C21	8000									
C22	30									
C23	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C24	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C25	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	Note 1
C26	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C27	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C28	10									
C29	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C30	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C31	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C32	1500			SI1500	D6-152	TM5D15	811-01	UC-5215	5HK-D15	
C33	100			SI100	D6-101	TM5T1	GP2K-152	UC-5215	5HK-D15	
C34	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C36	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C37	10000			BPD-01	DD-1032	TM5S1	811-01	UC-511	5HK-S1	
C38	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C39	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C40	1500			SI1500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C41	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C42	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C43	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C44	.1	200		P288-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C46	.01	400		P488-01	DD-1032	PTE4S1	GP2-333-103	PT411	4TM-S1	
C47	800			SI800	D6-751	TM5T8			5GA-T8	
C48	.005	400		P488-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	

CHASSIS—TOP VIEW



PROPERTY OF

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	RATING CAP.	RATING VOLT	PILOT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTE
C49	.033	400		P488-033			GP2-333-332	PT4133		
C50	.022	400		P488-022		PTE4S22	GP2-333-222	PT4122	4TM-S22	
C51	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C52	.01	400		P488-01	DD-1032	PTE4S1	GP2-333-103	PT411	4TM-S1	
C53	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C54	50			SI50	D6-500	TM5Q5	GP1K-500	UC-545	5GA-Q5	
C55	1000			SI1000	D6-102	TM5D1	GP2L-102	UC-521	5GA-D1	
C56	1200			SI1200	D6-122		GP2L-152	UC-5212	5GA-D12	
C57	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C58	2.2								5TCCB-V22	
C59	.047	400		P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C60	10000			BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C61	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C62	.01	600		489ZX-01		PTE6S1		PT411	6TM-S1	

Note 1. Some Models use an .01 Ⓐ 400V in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	36-45	Q13-133			UF55A	Volume
B	1 Meg		Not Req.	M13-137			UR16A	
C	Shaft		Not Req.	Not Req.			DS-36	Attach to R1A
D	Switch		Not Req.	76-1			US-26	Attach to R1B
R2A	5 Meg	½	37-27	Q13-141	AG-69-Z		U-65	Treble
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R2A
R3	30KΩ	½	36-40A					Hum-Balance
R4A	5 Meg	½	37-27	Q13-141	AG-69-Z		U-65	Bass
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R4A

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	IRC PART No.	NOTES
R5	270KΩ	½		BTS-270K	
R6	5600Ω	½		BTS-5600	
R7	1 Meg	½		BTS-1 Meg	
R8	5600Ω	½		BTS-5600	
R9	1000Ω	½		BTS-1000	
R10	6800Ω	½		BTS-6800	
R11	3300Ω	½		BTS-3300	
R12	22KΩ	½		BTS-22K	
R13	470Ω	½		BTS-470	
R14	68Ω	½		BTS-68	
R15	470KΩ	½		BTS-470K	
R16	560Ω	½		BTS-560	
R17	27KΩ	1		BTA-27K	
R18	1 Meg	½		BTS-1 Meg	
R19	1000Ω	½		BTS-1000	
R20	270KΩ	½		BTS-270K	
R21	5600Ω	½		BTS-5600	
R22	1000Ω	½		BTS-1000	
R23	39KΩ	½		BTS-39K	
R24	82KΩ	½		BTS-82K	
R25	27KΩ	½		BTS-27K	
R26	1 Meg	½		BTS-1 Meg	
R27	5600Ω	½		BTS-5600	
R28	1000Ω	½		BTS-1000	
R29	39KΩ	½		BTS-39K	
R30	10KΩ	½		BTS-10K	
R31	10KΩ	½		BTS-10K	
R32	2200Ω	½		BTS-2200	
R33	82KΩ	½		BTS-82K	
R34	470Ω	½		BTS-470	
R35	10KΩ	½		BTS-10K	
R36	1 Meg	½		BTS-1 Meg	
R37	470Ω	½		BTS-470	

ITEM No.	RATING OHMS	RATING WATT	PILOT PART No.	IRC PART No.	NOTES
R38	10KΩ	½		BTS-10K	
R39	12KΩ	½		BTS-12K	
R40	22KΩ	½		BTS-22K	
R41	2.2Meg	½		BTS-2.2Meg	
R42	15KΩ	½		BTS-15K	
R43	470KΩ	½		BTS-470K	
R44	68KΩ	1		BTA-68K	
R45	82KΩ	1		BTA-82K	
R46	2200Ω	½		BTS-2200	
R47	8200Ω	½		BTS-8200	
R48	82KΩ	½		BTS-82K	
R49	39KΩ	½		BTS-39K	
R50	68KΩ	½		BTS-68K	
R51	100KΩ	½		BTS-100K	
R52	1 Meg	½		BTS-1 Meg	
R53	180KΩ	½		BTS-180K	
R54	3300Ω	½		BTS-3300	
R55	4.7Meg	½		BTS-4.7Meg	
R56	220KΩ	½		BTS-220K	
R57	330KΩ	1		BTA-330K	
R58	100KΩ	½		BTS-100K	
R59	220KΩ	1		BTA-220K	
R60	3300Ω	1		BTA-3300	
R61	220KΩ	½		BTS-220K	
R62	220KΩ	½		BTS-220K	
R63	4700Ω	½		BTS-4700	
R64	5600Ω	½		BTS-5600	
R65	39KΩ	½		BTS-39K	
R66	100Ω	2			
R67	100KΩ	½		BTS-100K	
R68	27KΩ	½		BTS-27K	
R69	3Ω	½			

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC Ⓐ .16A	300VCT .056A	6.3VAC Ⓐ .57A	6.3VAC Ⓐ 3.3A					

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	PILOT PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	FM Ant. Coil	0Ω		70-78				
L2	RF Choke	1.1Ω		75-33			4610	6 Microhenries
L3	FM RF Coil Assy.	0Ω		271-34				
L4	Fil. Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L5	Cathode Choke	1.1Ω		75-33			4610	6 Microhenries
L6	FM Osc. Coil Assy.	0Ω		272-56				
L7	Fil. Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L8	RF Choke	1.1Ω		75-33			4610	6 Microhenries
L9	AM Ant. Coil	0Ω	.1Ω	270-52				
L10	IF Trap	25Ω		79-102				
L11	AM RF Coil	7.5Ω		71-38				Tapped Ⓐ 3.8Ω
L12	AM Osc. Coil	2.5Ω		72-73			71-Osc.	Tapped Ⓐ 1.1Ω
L13	RF Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L14	1st. FM IF	.7Ω	.7Ω	2753-151	16-3487	FM-254	1463	
L15	1st. AM IF	9.5Ω	9.5Ω	273-129	16-6758	BC-352	12-C1	
L16	2nd. FM IF	.7Ω	.7Ω	273-151	16-3487	FM-254	1463	
L17	2nd. AM IF	9.5Ω	9.5Ω	273-129	16-6758	BC-353	12-C2	
L18	Ratio Det.	1.6Ω	.9ΩCT	279-72	17-3488 *	FM-255	1465	Tertiary winding -.4Ω
L19	RF Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L20	RF Line Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry
L21	RF Line Choke	0Ω		75-19	19-3001	TV-189	6175	.9 Microhenry

* Cut out chassis hole & drill mtg. holes.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	PILOT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L22	.056A	135Ω	4HY					C-15X ①

① Drill one new mtg. hole.

MISCELLANEOUS

ITEM No.	PART NAME	PILOT PART No.	NOTES
M1	Pilot Light	68-6	Function Indicator and Dial Light, Type #47 (6 Used)
M2	Tuning Capacitor	26-56	30-482MMF, 30-482MMF, 13-155MMF
M3	Switch	100-81	Function Selector
M4	Switch	100-77	AFC Off-On
M5	Switch	100-86	Equalizer
M6	Switch	101-26	Preamplifier In-Out

PHOTOFACT* Folder

SILVERTONE MODELS 3110, A, 3115, A, 3160, A
(Ch. 528.242, -1, -2, 528.248, -1, -2)

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MODEL 3160A

SILVERTONE MODELS 3110, A, 3115, A, 3160, A
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SILVERTONE
MODELS 3110, A, 3115, A, 3160, A
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SILVERTONE MODEL 3160A (Ch. 528.242-1)

TRADE NAME	Silvertone	MODELS	CHASSIS
		3110A	528.242, -1, -2
		3110	528.248, -1, -2
		3115A	528.242, -1, -2
		3115	528.248, -1, -2
		3160A	528.242, -1, -2
		3160	528.248, -1, -2
SUPPLIER	Sears Roebuck & Co., 925 S. Homan Ave., Chicago, Ill.		
TYPE SET	Television Receiver		
TUBES	Twenty-one		
POWER SUPPLY	110-120 Volts AC-60 Cycle	RATING 1.8 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13, Video IF 26.25MC, Sound IF 21.75MC (Intercarrier)		

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DATE 11-53 SET 220 FOLDER 7

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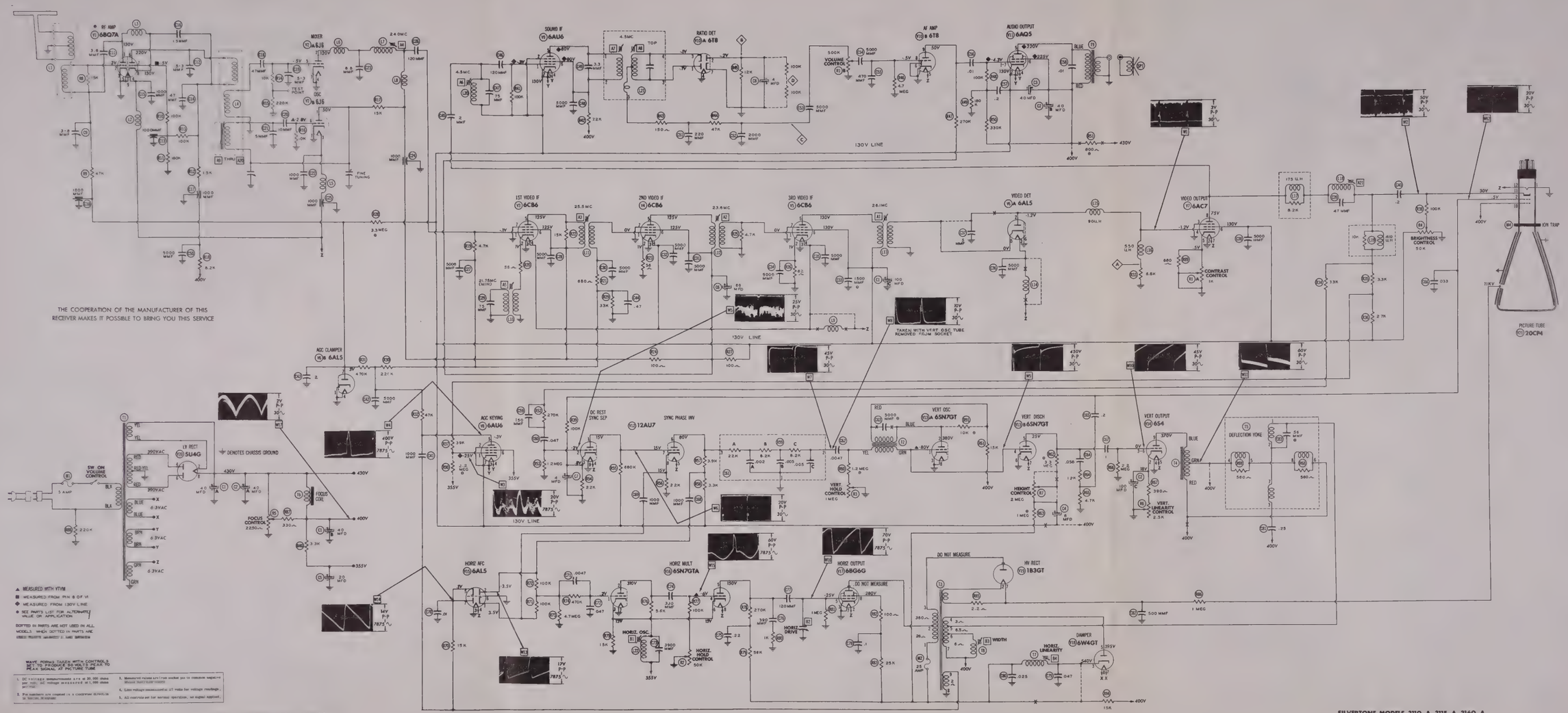
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
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SILVERTONE MODELS 3110, A, 3115, A, 3160, A
(Ch. 528.242, -1, -2, 528.248, -1, -2)
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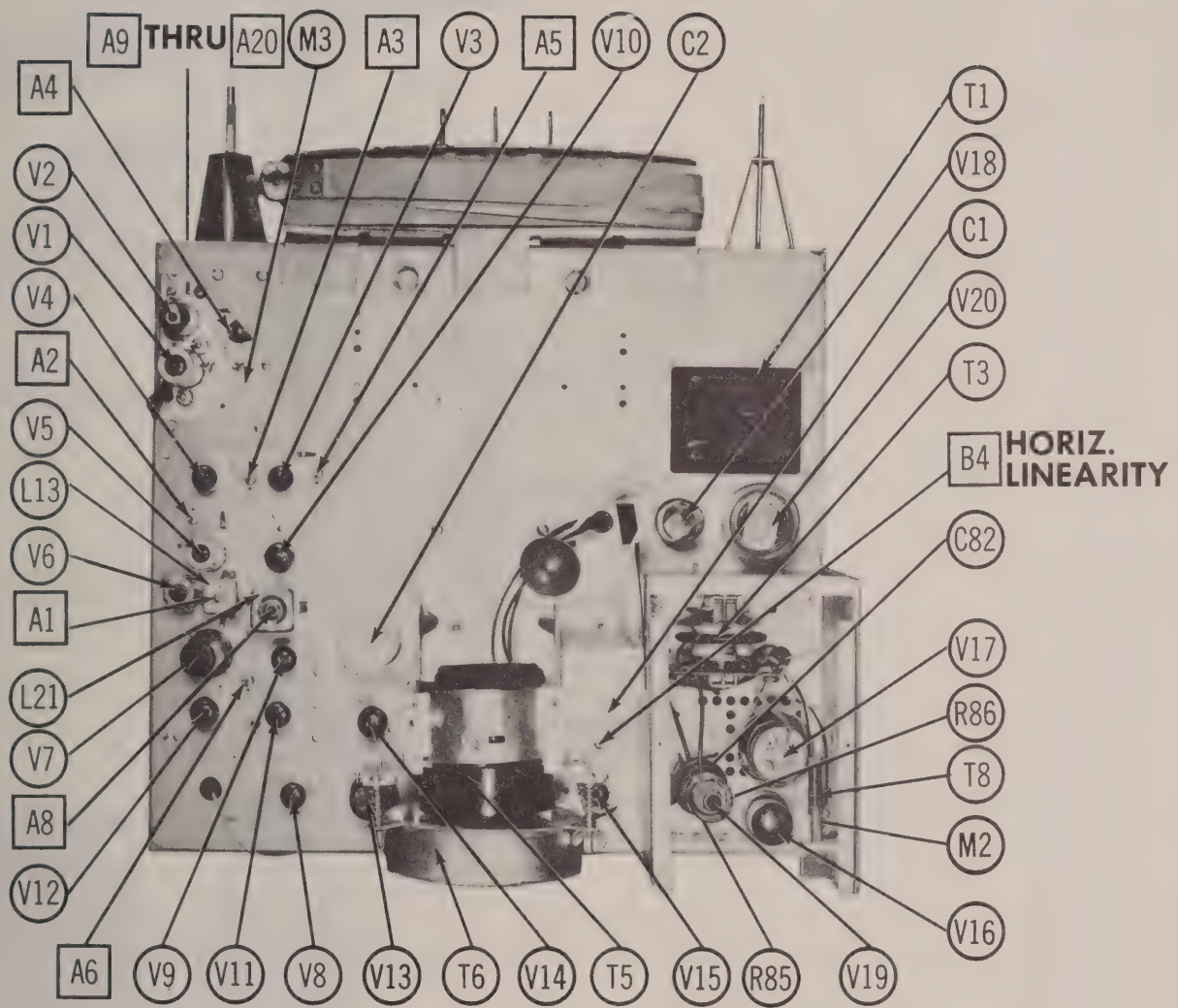

CHASSIS TOP VIEW

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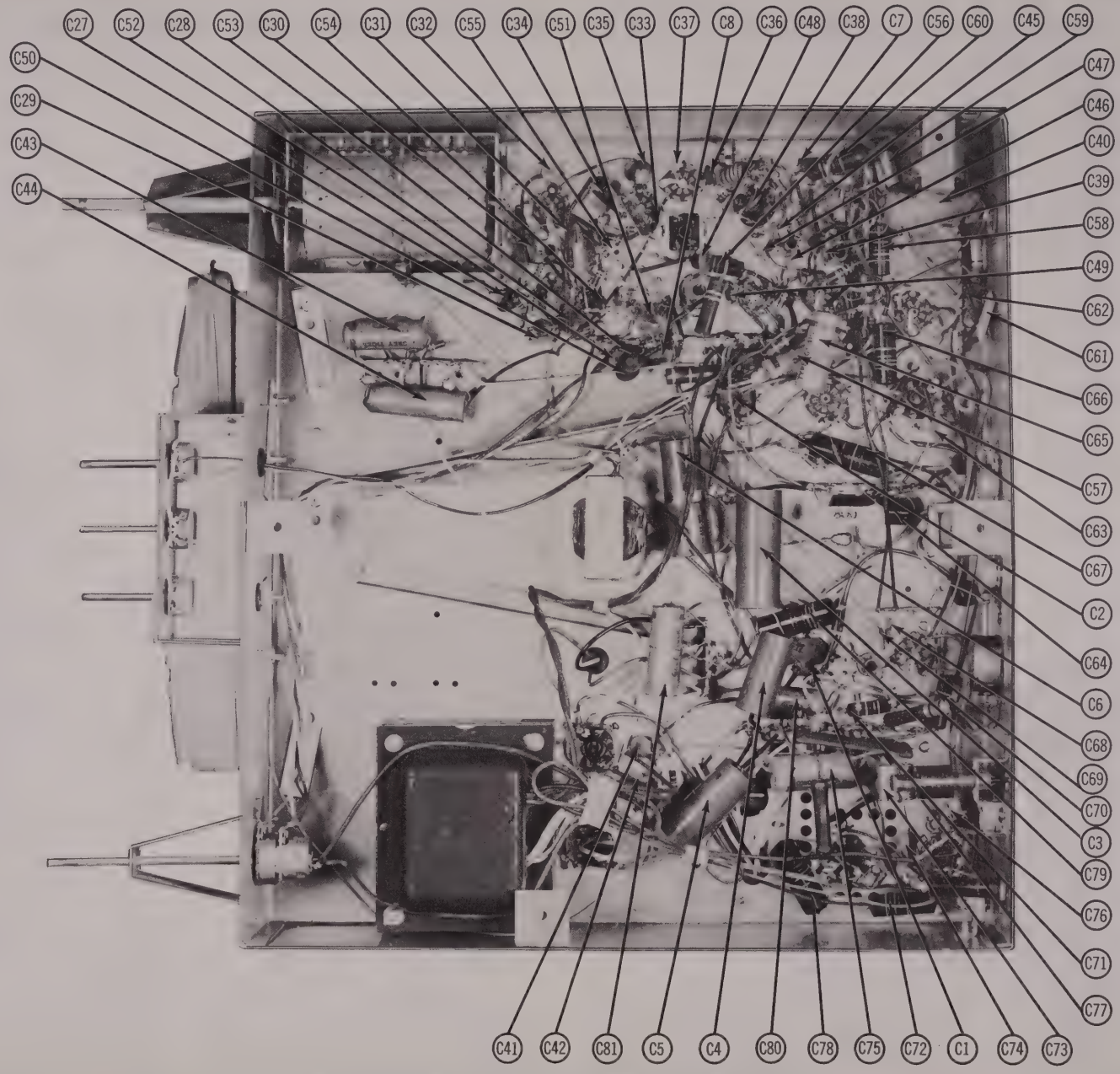

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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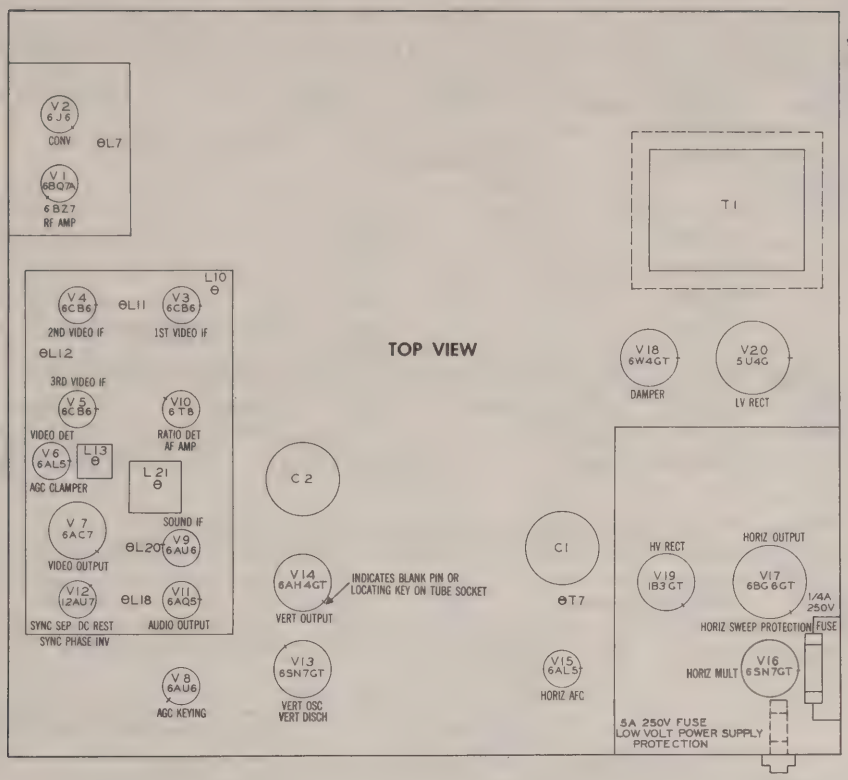

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V20 , fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6, V7, V11
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V21
Has pic, no sound - V9, V10, V11
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V12, V13, V14
No horiz. sync - V12, V15, V16
No vert. or horiz. sync - V12

SWEEP FAILURE
No raster, has sound - V16, V17, V18, V19, V21, fuse (M2)
No vertical deflection - V13, V14
Poor vert. linearity or foldover - V13, V14
Poor horiz. linearity or foldover - V16, V17, V18
Narrow picture - V16, V17, V18, V19, V20
Vert. off freq. - V12, V13, V14
Horiz. off freq. - V12, V15, V16

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube. Low side to chassis.	26.1MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	23.8MC	"	"	A2	"
3.	"	"	25.5MC	"	"	A3	"
4.	"	"	24.0MC	"	"	A4	"
5.	"	"	21.75MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp)	21.75MC 26.25MC	Any	Vert. Amp. to point (A). Low side to chassis.		Check for response curve similar to Fig.1. If necessary, retouch A1 thru A4.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B). Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C). Common to chassis.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor (C8). Adjust for maximum amplitude and symmetry as in Fig. 2.
8.	"	"	"	"	"	Vert. Amp. to point (C). Low side to chassis.	A8	Reconnect stabilizer capacitor (C8). Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. to point (A). Low side to chassis.	A9	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A10	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A11	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A12	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A13	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A14	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A15	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A16	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A17	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A18	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A19	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A20	

ALIGNMENT INSTRUCTIONS (cont)

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RF AND MIXER ALIGNMENT

The RF and mixer portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

4.5MC TRAP ALIGNMENT

Tune in a TV station and examine picture for evidence of 4.5MC interference. If any is noted, adjust A21 to minimize it.

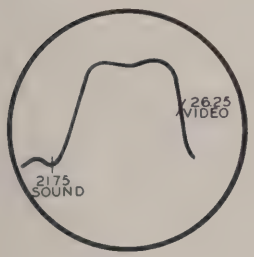


FIG. 1

FIG. 2

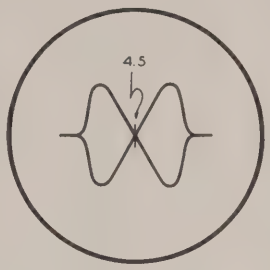


FIG. 3

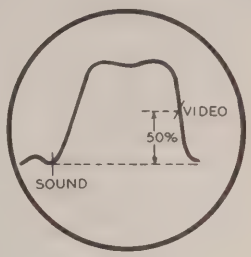
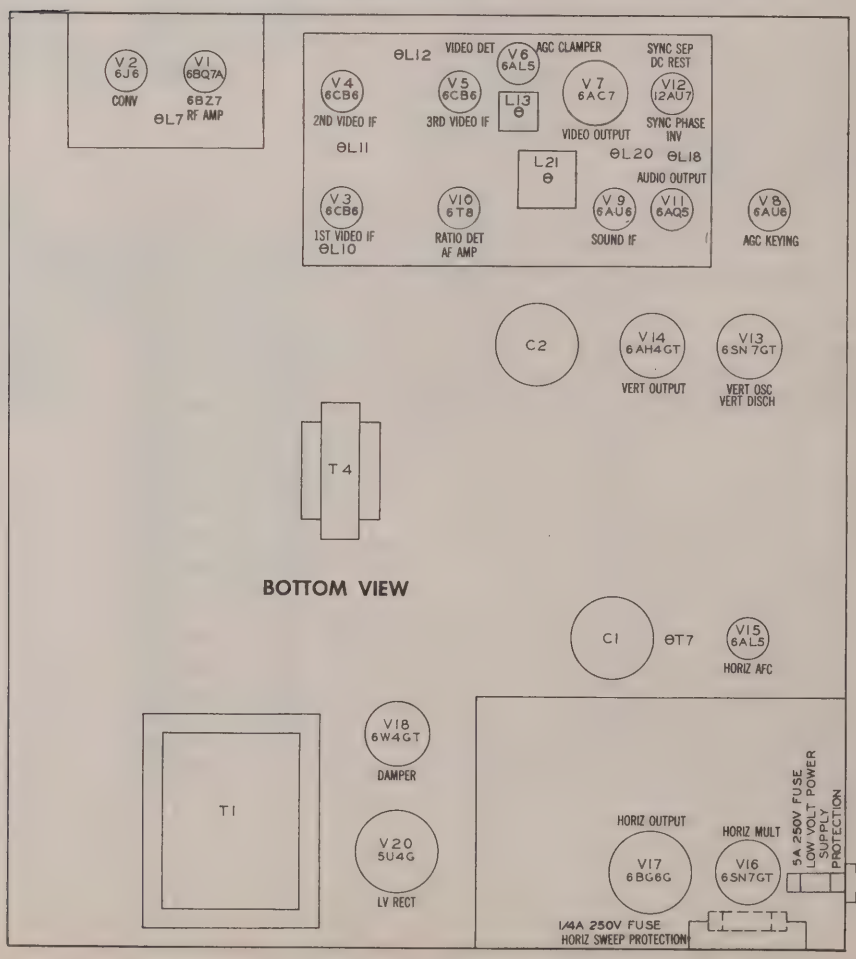


FIG. 4

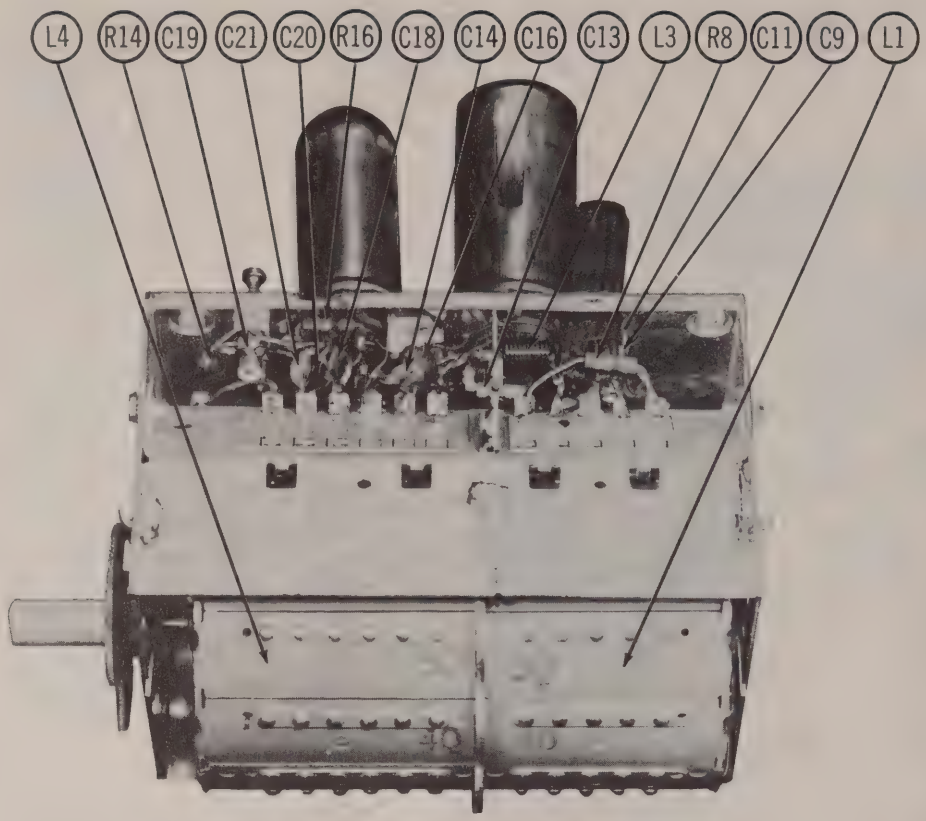
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	750KΩ	0Ω	.1Ω	0Ω	†10KΩ	180KΩ	INF	0Ω
V 2	6J6	♦15KΩ	♦200Ω	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	40KΩ	56Ω	0Ω	.1Ω	♦200Ω	♦200Ω	0Ω		
V 4	6CB6	33KΩ	56Ω	0Ω	.1Ω	♦100Ω	♦100Ω	0Ω		
V 5	6CB6	.3Ω	82Ω	0Ω	.1Ω	♦.3Ω	♦0Ω	0Ω		
V 6	6AL5	0Ω	6.8KΩ	.1Ω	0Ω	.3Ω	0Ω	700KΩ		
V 7	6AC7	0Ω	0Ω	0Ω	6.8KΩ	65Ω	♦0Ω	.1Ω	♦6KΩ	
V 8	6AU6	♦40KΩ	♦0Ω	♦0Ω	♦.2Ω	300KΩ	†3.5KΩ	♦0Ω		
V 9	6AU6	♦100KΩ	♦0Ω	♦0Ω	♦.2Ω	†22KΩ	†22KΩ	♦0Ω		
V 10	6T8	INF	12KΩ	INF	0Ω	.1Ω	0Ω	0Ω	4.7Meg	♦270KΩ
V 11	6AQ5	280KΩ	35KΩ	♦0Ω	♦.2Ω	†1KΩ	†800Ω	280KΩ		
V 12	12AU7	♦680KΩ	1.2Meg	22KΩ	.1Ω	.1Ω	♦7.2KΩ	♦680KΩ	22KΩ	0Ω
V 13	6SN7GT	1.5Meg	†15KΩ	0Ω	1.5Meg	‡ 4.7Meg	0Ω	.1Ω	0Ω	
V 14	6S 4	INF	1.5KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	INF	INF	†1KΩ
V 15	6AL5	4.8Meg	4.8Meg	0Ω	.1Ω	15KΩ	0Ω	15KΩ		
V 16	6SN7GTA	5Meg	†9KΩ	1.5KΩ	110KΩ	‡325KΩ	1.5KΩ	0Ω	.1Ω	
V 17	6BG6G	‡25KΩ	.1Ω	0Ω	‡25KΩ	1Meg	INF	0Ω	‡25KΩ	TOP CAP ‡63Ω
V 18	6W4GT	INF	INF	60KΩ	†350Ω	†350Ω	INF	INF	INF	
V 19	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ‡440Ω
V 20	5U4G	INF	50KΩ	INF	24Ω	INF	25Ω	INF	50KΩ	
V 21	20CP4B	0Ω	120KΩ	PIN 10 †340Ω	PIN 11 100KΩ	PIN 12 .1Ω				

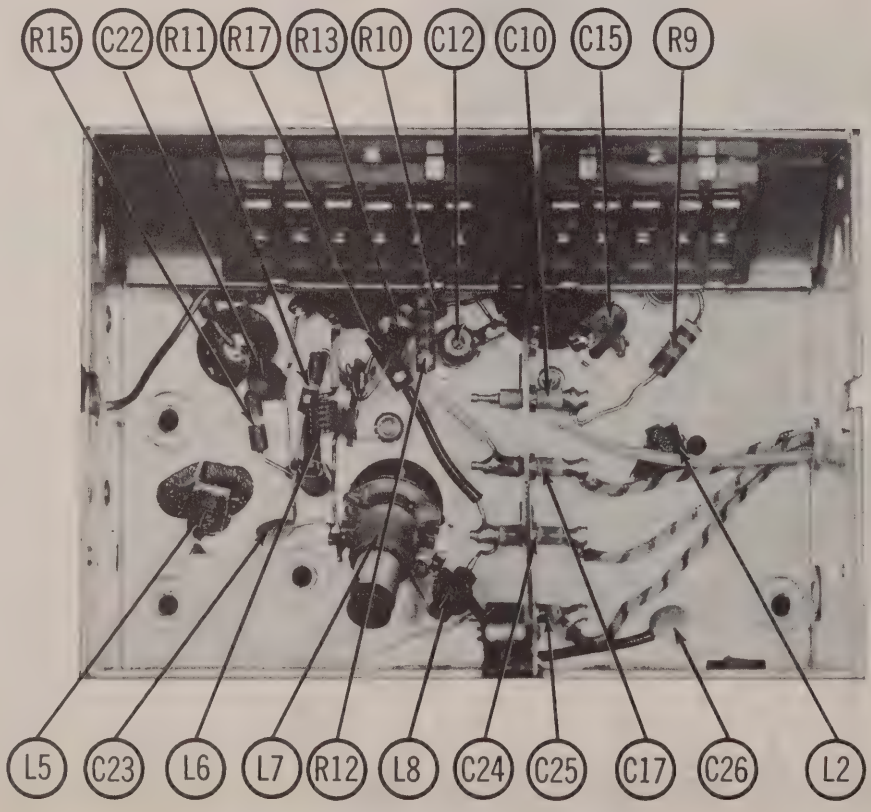
† MEASURED FROM PIN 8 OF V20
♦ MEASURED FROM PIN 2 OF V11
‡ MEASURED FROM PIN 3 OF V18



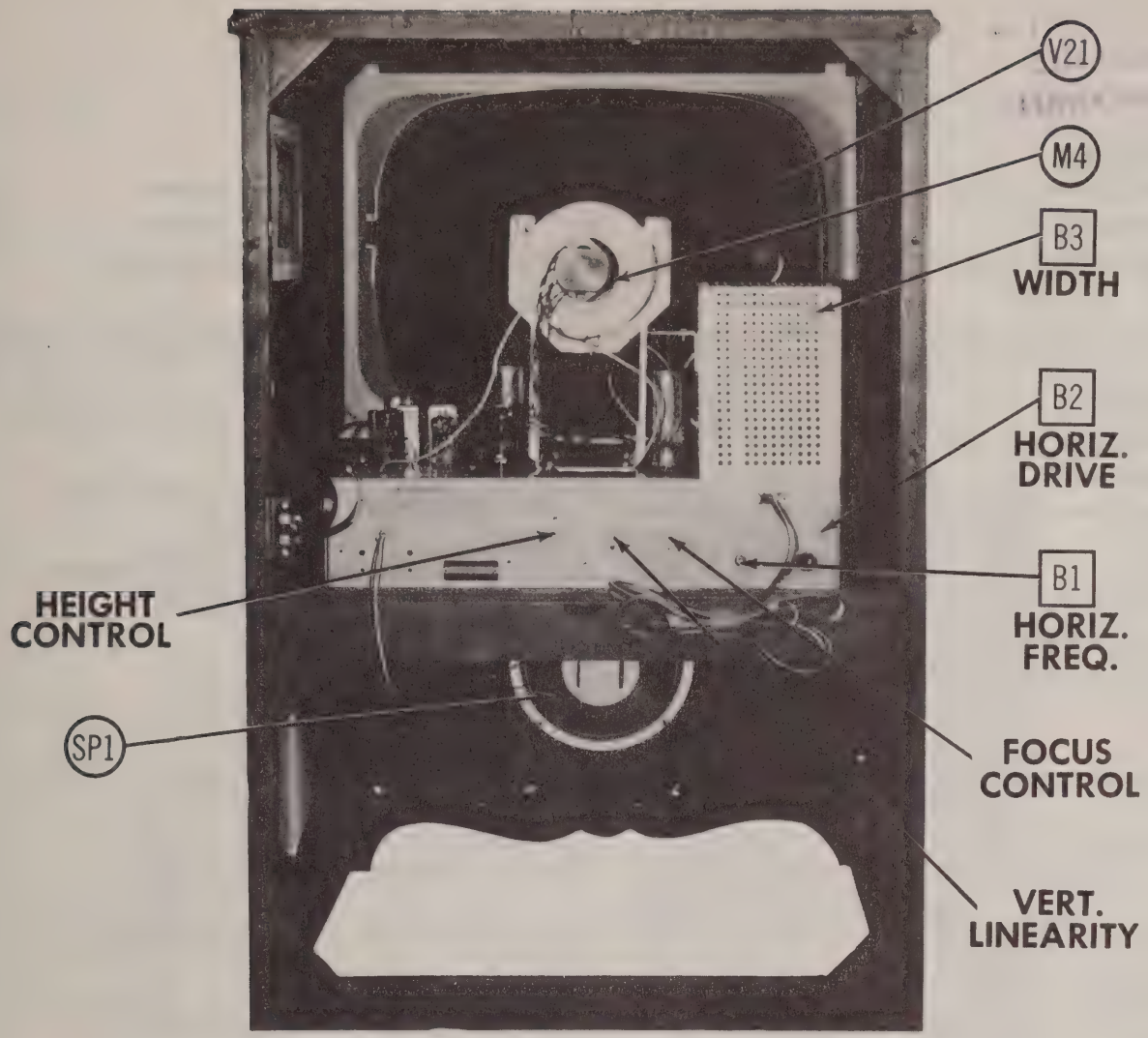
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set horizontal hold control at mid-range and adjust horizontal oscillator slug (B1) until the picture synchronizes horizontally. Make slight readjustments of B1 if necessary for best overall sync on all channels.

Adjust the horizontal drive trimmer (B2) counter clockwise as far as possible without the presence of vertical white lines ore compression of the center of the picture.

Adjust width slug (B3) for a picture slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V16, V17, V18 and V20. Check adjustment of B2, B3, and B4. Check waveform at W16.

If Satisfactory	If Unsatisfactory
Check C79, C80, C81, T3, T5A, C78 and other associated circuit components.	Check C74, C76, C77, R76, R78, R79, L22 and other associated circuit components.

DRIVE LINES

Check by substitution V16, V17 and V18. Check T3, T5A, C79, C80, C76, C77 and other associated circuit components.

COMPRESSED LEFT SIDE

Check by substitution V17 and V18. Check C78, T3, T5A and other associated components.

FOLDS

Check by substitution V17 and V18. Check boost B+ filter network, T3 and T5A.

XMAS TREE EFFECT

Check by substitution V16. Check L22, C73 and C74. Check other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V13 and V14. Check waveform at W10.

If Satisfactory	If Unsatisfactory
Check T4, T5B and other associated circuit components.	Check C64, C67, C62, C63, T2 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V13, V14 and V20. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep"

COMPRESSED AT BOTTOM

Check by substitution V13 and V14. Check T4, T5B and other associated components.

COMPRESSED AT TOP

Check by substitution V13 and V14. Check vertical linearity control, C2C and R67. Check other associated circuit components.

FOLDS

Check by substitution V13 and V14. Check C64, C67 and other associated components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V15 and V16. Check waveform at W14.

If Satisfactory	If Unsatisfactory
Check C68, C69, C71, C72, C73, C74 and other associated components.	Check C70, R70 and T3.

CRITICAL HOLD

Check by substitution V12, V15 and V16. Proceed as outlined under "Loss of Sync".

PIE CRUST EFFECT

Check C72 for open.

VERTICAL

LOSS OF SYNC

Check by substitution V12 and V13. Check waveform at W7.

If Satisfactory	If Unsatisfactory
Check components associated with V13.	Check vertical integrator and other components associated with V12.

CRITICAL HOLD

Check by substitution V12 and V13. Proceed as outlined under "Loss of Sync".

TRIGGERING

Substitute V12 and V13. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Check C40, R38, R4, picture tube and other associated components.

SOUND BARS

Check local oscillator adjustment in RF tuner. Check 4.5MC trap adjustment (A21). Check video IF alignment.

NEGATIVE PIX

Check by substitution V6 and V7. Check picture tube and other associated components. Check video IF tube and components. Check AGC for proper operation.

POOR CONTRAST

Substitute V6 and V7. Check picture tube and other associated circuit components.

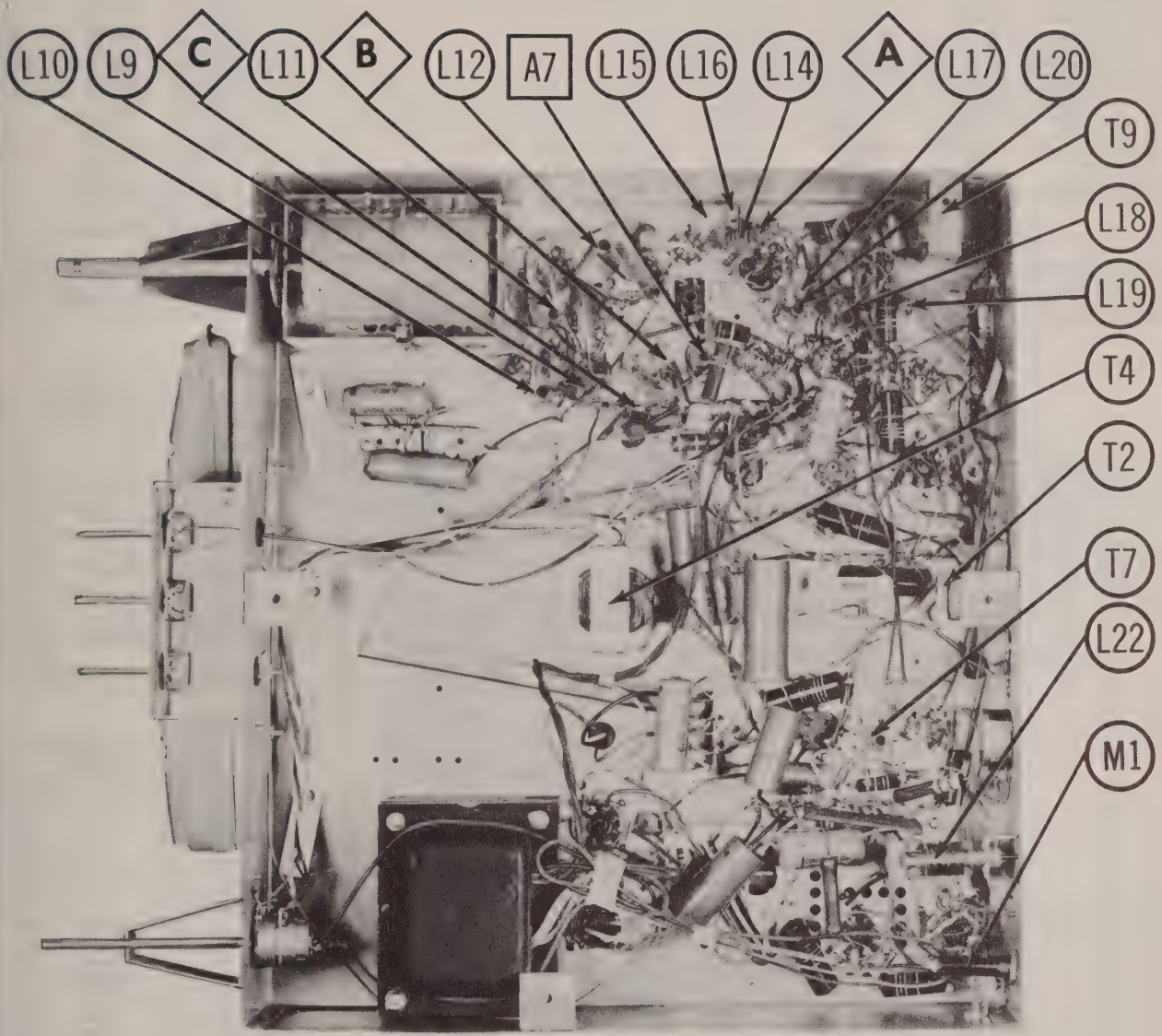
SMEAR

Check by substitution V6 and V7. Check C38, C39, R34, R35, R36, L17 and L19. Check picture tube and other associated components.

ONE WIDE BLACK BAR ACROSS PIX

Check RF tuner, video IF and video detector and amplifier tubes for heater to cathode leakage.

PROPERTY OF
L. P. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SILVERTONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1A	RF Amplifier	6BQ7A	6BQ7A	9AJ	
B	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6J6	6J6	7BF	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Detector				
	AGC Clamper	6AL5	6AL5	6BT	
V7	Video Output	6AC7	6AC7	8N	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector-				
	AF Amplifier	6T8	6T8	9E	
V11	Audio Output	6AQ5	6AQ5	7BZ	
V12	Sync Separator-				
	DC Restorer-				
	Sync Phase Inv.	12AU7	12AU7	9A	
V13	Vert. Osc.-				
	Vert. Discharge	6SN7GT	6SN7GT	8BD	
V14	Vert. Output	6S4	6S4	9AC	
V15	Horiz. AFC	6AL5	6AL5	6BT	
V16	Horiz. Mult.	6SN7GTA	6SN7GTA	8BD	
V17	Horiz. Output	6BG6G	6BG6G	5BT	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rectifier	1B3GT	1B3GT	3C	
V20	LV Rectifier	5U4GT	5U4GT	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SILVERTONE PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V21	20CP4	20CP4 20CP4A ① 20DP4 ② 20DP4A ② ①	20CP4	12D 12D 12D 12D	① Circuit changes necessary. ② 3/8" longer

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	▲40	450								
C	▲100	200								
C2A	▲40	450	T18-295	AFH3-159		C118		FP375	TVL-3764	
B	▲40	450								
C	▲100	200								
C3	40	400	T18-308	PRS450/40		BR4045A		TC78	TVA-1712	
C4	8	500	T18-298	PRS500/8		BR550A		TC81	TVA-1902	
C5	20	450	T18-276	PRS450/20		BR2045A		TC75	TVA-1709	
C6	80	200	T18-302	PRS200/80- 86		BR5025		TC59	TVA-1713	
C7	4	50	T18-292	PRS150/4		BR415		TC30	TVA-1402	
C8	4	50	T18-292	PRS150/4		BR415		TC30	TVA-1402	
C9	3-8				829-10					
C10	1000			CN-1-001	MFT-1000				503C-D1	
C11	3.6						NP0K-3R6			
C12	.5-3				829-3			CT565A		
C13	1000			CN-1-001	MFT-1000				503C-D1	
C14	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C15	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C16	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C17	1000			CN-1-001	MFT-1000				503C-D1	
C18	47			BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C19	.5-3				829-3			CT565A		
C20	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C21	9			SI5N750	TCN-5		N750K-050		5TCUB-V5	
C22	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C23	6.8			SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C24	1000			CN-1-001	MFT-1000				503C-D1	
C25	1000			CN-1-001	MFT-1000				503C-D1	
C26	130			BPD-00012	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C27	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C28	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C29	75	500								
C30	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C31	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C32	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C33	1500			BPD-0015	DD-152	TM5D15	801-0015	DC-5215	5HK-D15	Note 1
C34	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C35	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C36	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C37	5		T15-222	SI5NP0	TCZ-4.7		NP0K-050	ZT-555	5TCCB-V47	
C38	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C39	47			SI47NP0	TCZ-47		NP0K- 470	ZT-5447	5TCC-Q47	
C40	.2	200	T16-212	484-2		PTE4P22		TP429	2TM-P22	
C41	1000		T15-220	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C42	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C43	.2	400	T16-188	484-2		PTE4P22		TP429	4TM-P22	
C44	1.47	300	T15-240	P288-47		P47P6		PT405	2TM-P47	
C45	2									
C46	120				TCN-120					
C47	75			SI75N750	TCN-75		N750L-750	NT-5475	5TCU-Q75	
C48	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C49	3.3		T15-238	SI3.3NP0	TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C50	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C51	220	500	T15-230							
C52	2000		T15-226	BPD-002	DD-202	TM5D2	801-002	DC-522	5HK-D2	
C53	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C54	5000		T18-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	
C55	470	500	T15-200	1468-0005	D6-471	5W5T5	GP2K-471	MC245	1FM-35	

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C56	.01	600	T16-237	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C57	.2	400	T16-188	484-2		PTE4P22		TP429	4TM-P22	
C58	.01	600	T16-237	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C59	150	500	T15-235	1468-00015	D6-151	5W5T15	GP2K-151	MC236	1FM-315	
C60	.047	600	T16-235	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C61A	.002			P688-002		PTE6D2		PT622		
B	.005		◆ T17-106	P688-005	◆PC-100	PTE6D5	◆1405-01	PT625	◆101C1	
C	.005			P688-005		PTE6D5		PT625		
C62	.0047	600	T16-233	P688-0047	D6-472	PTE6S47	GP2-333-472	PT6247	6TM-D47	
C63	5000		T16-177	BPD-005	MD-502	TM5D5	81I-005	DC-525	5HK-D5	Note 2
C64	.056	600	T16-236							
C65	.2	400	T16-188	484-2		PTE4P22		TP429	4TM-P22	
C66	.033	600	T16-234	P688-033				PT6133		
C67	.1	600	T16-238	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C68	1000		T15-220	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C69	1000		T15-220	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C70	.01	600	T16-235	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C71	.0047	600	T16-233	P688-0047	D6-472	PTE6S47	GP2-33-472	PT6247	6TM-D47	
C72	.047	600	T16-235	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C73	3900	500		1464-004		IDR5D4		MCB463	MS-34	
C74	330	500	T15-226							
C75	.22	600	T16-218	684-25		PTE6P25		PT6025	6TM-P25	
C 76	390	500	T15-231	1469-0004		SR5T4		MCB343	MS-34	
C77	120		T15-232							
C78	.1	600	T16-238	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C79	.047	1000	T16-239	P1088-047		PTE16S47		PT16147	MB-S47	
C80	.025	1000	T16-222	P1088-025		PTE16S25				
C81	.25	400	T16-226	P488-25		PTE4P25		PT4025	4TM-P25	
C82	500	20000	T15-239	HV20C	TV3-502	MM-C20T5	413-501	HV20035A	20DK-T5	
C83	56	2000							20GA-Q56	Note 3

Note 1. Ch. 528.242, 528.248, 528.248-1, 528.248-2 use 5000MMF in this application.
Note 2. Ch. 528.242, 528.248, 528.248-1, 528.248-2 do not use this item.
Note 3. Some Models use 50MMF. Replace with original value.
◆ Items C61A, C61B, C61C, R59A, R59B, R95C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	½	T24-197	Q7-362 ◆				Contrast-Panel
B	500KΩ	½						Volume & Sw.-Rear
R2A	50KΩ	½	T25-21	Q11-123	AG-44-S	AB-31	U-35	Horiz.Hold-Note 1
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	1Meg	½	T25-22	Q11-137	AG-61-S	AB-59	U-54	Vert.Hold-Note 2
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	500Ω	½	T25-21	Q11-123	AG-44-S	AB-31	U-35	Brightness -Note 1
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	2250Ω	2	T25-14	WK-2500	A43-2500	VK-132	R2500L	Focus-wire wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R5A
R6A	2500Ω	½	T25-13	Q11-113	AG-15-S	AB-7	SU-6	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	2Meg	½	T25-15	Q11-139	AG-83-S	AB-75	SU-56	Height
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-108 & P1-400 (Panel)
B13-133 & R2-420 (Rear) & SWITCH 76-1

Note 1. Some Models use an alternate control (part #T25-10).
Note 2. Some Models use an alternate control (part #T25-17).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R8	15KΩ	½		BTS-15K	
R9	47KΩ	½			
R10	100KΩ	½		BTS-100K	
R11	160KΩ 5%	½		BTS-160K 5%	
R12	1500Ω	½		BTS-1500	
R13	100KΩ 5%	½			
R14	10KΩ	½		BTS-10K	
R15	220KΩ	½		BTS-220K	
R16	10KΩ	½		BTS-10K	
R17	15KΩ	½			
R18	8200Ω	2	T60-878	BTS-8200	
R19	4700Ω	½	T60-759	BTS-4700	
R20	56Ω	½	T60-806	BTS-56	
R21	680Ω	½	T60-708	BTS-680	
R22	15KΩ	½	T60-783		
R23	56Ω	½	T60-806	BTS-56	
R24	100Ω	½	T60-752	BTS-100	
R25	4700Ω	½	T60-759	BTS-4700	
R26	82Ω	½	T60-776	BTS-82	
R27	100Ω	½	T60-752	BTS-100	
R28	3.3Meg	½	T60-761	BTS-3.3Meg	Note 1
R29	33KΩ	½	T60-748	BTS-33K	
R30	220KΩ	½	T60-672	BTS-220K	
R31	470KΩ	½	T60-731	BTS-470K	
R32	47KΩ	½	T60-730	BTS-47K	
R33	6800Ω	½	T60-786	BTS-6800	
R34	33KΩ	½	T60-748	BTS-33K	
R35	3300Ω	1	T60-734	BTA-3300	
R36	2700Ω	1	T60-892	BTA-2700	
R37	39KΩ	½	T60-893	BTS-39K	
R38	100KΩ	1		BTA-100K	
R39	100KΩ	½	T60-901	BTS-100K	
R40	3300Ω	2	T60-816	BTB-3300	
R41	100KΩ	½	T60-801		
R42	22KΩ	2	T60-810		
R43	150Ω	½	T60-767	BTS-150	
R44	47KΩ	½	T60-730	BTS-47K	
R45	12KΩ	½	T60-811	BTS-12K	
R46	4.7Meg	½	T60-779	BTS-4.7Meg	
R47	270KΩ	½	T60-747	BTS-270K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R48	100KΩ	½	T60-801	BTS-100K	
R49	180KΩ 5%	½	T60-788	BTS-180K 5%	
R50	330KΩ 5%	½	T60-787	BTS-330K 5%	
R51	800Ω	5		1 3/4A-800	Note 8
R52	270KΩ	½	T60-747	BTS-270K	
R53	1.2Meg	½	T60-782	BTS-1.2Meg	
R54	22KΩ	½	T60-744	BTS-22K	
R55	680KΩ	½	T60-807	BTS-680K	
R56	2200Ω	½	T60-714	BTS-2200	
R57	3900Ω	½	T60-710	BTS-3900	
R58	3300Ω	½	T60-882	BTS-3300	
R59A	22KΩ	½		BTS-22K	
B	8200Ω	½	◆T17-106	BTS-8200	
C	8200Ω	½		BTS-8200	
R60	1.2Meg	½	T60-782	BTS-1.2Meg	Notes 4, 5
R61	15KΩ	½	T60-783	BTS-15K	
R62	3.3Meg	½	T60-761	BTS-3.3Meg	Note 7
R63	1Meg	1	T60-877	BTA-1Meg	Note 3
R64	1200Ω	½	T60-756	BTS-1200	
R65	4700Ω	½	T60-759	BTS-4700	
R66	2.2Meg	½	T60-726	BTS-2.2Meg	
R67	390Ω	½	T60-865	BTS-390	
R68	560Ω	½		BTS-560	
R69	560Ω	½		BTS-560	
R70	15KΩ	1	T60-887	BTA-15K	
R71	100KΩ	1	T60-801	BTA-100K	
R72	100KΩ	1	T60-801	BTA-100K	
R73	4.7Meg	½	T60-779	BTS-4.7Meg	
R74	470KΩ	½	T60-731	BTS-470K	
R75	1500Ω	½	T60-729	BTS-1500	
R76	5600Ω	½		BTS-5600	
R77	100KΩ	1	T60-801	BTA-100K	
R78	270KΩ	½	T60-747	BTS-270K	
R79	56KΩ	½	T60-802	BTS-56K	
R80	1000Ω	½	T60-675	BTS-1000	
R81	1Meg	½	T60-868	BTS-1Meg	
R82	100Ω	½	T60-752		
R83	25KΩ	10	T60-853	1 3/4A-25K	
R84	15KΩ	5	T60-804	1 3/4A-15K	
R85	2.2Ω	½	T60-881		

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R86	1Meg	1	T60-877		
R87	330Ω	2	T60-814	BTB-330	
R88	220KΩ	½	T60-867	BTS-220K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: SILVERTONE PART No.	IRC PART No.	NOTES
R89	680Ω	½	T60-708	BTS-680	
R90	2.2Meg	½	T60-726	BTS-2.2Meg	Note 2
R91	10KΩ	½	T60-760	BTS-10K	Note 6

Note 1. Ch. 528.242-2 uses a 2.2Meg resistor in this application.
Note 2. Used only in Ch. 528.242-2.
Note 3. Ch. 528.242-2, 528.242, 528.248-2, 528.248 and 528.248-1 uses a 56KΩ resistor in this application.
Note 4. Ch. 528.248 and 528.248-1 uses a 1.5Meg resistor in this application.
Note 5. Ch. 528.242 and 528.248-2 uses either a 1.5Meg or a 1.8Meg resistor in this application.
Note 6. Not used in Ch.528.242-1 and 528.242-2.
Note 7. Ch. 528.242, 528.248-2, 528.248 and 528.248-1 uses a 2.7Meg resistor in this application.
Note 8. Not used in Ch. 528.242 and 528.248-2.
◆ Items R59A, R59B, R59C, C61A, C61B, C61C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC ④ 1.8A.	780VCT .210ADC	5VAC ③ 3A.	6.3VAC ② .99A.	80-264	P-8169				
			SEC. 4	SEC. 5						
			6.3VAC ② 1.15A.	6.3VAC ② 7.4A.						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	170Ω	940Ω	T80-257	A-8125 ①	A-3003 ①	TBO-5 ①	A-97X ①	209T1 ①	Vert. Osc. Trans.
T3	406Ω tap ② 26Ω	10.1Ω tap ② .6Ω, 7.1Ω	T80-279	A-8136	HVO-10 ① ②	TFB-5 ① ③ ④	D-14① ④	231T1 ⑬ ⑭	Horiz. Output Trans.
		SEC. 2							
		2Ω							
		SEC. 3							
		0Ω							
T4	1050Ω tap ② 12Ω		T80-261	A-8123	A-3037	TSO-8	A-102X	222T1	Vert. Output Trans.
T5A	13Ω		T83-694	DY-8A ⑦	MDF-70 ⑦	TY-2 ⑧	Y-12	206D1 ⑧	Horiz. Deflection Coils
B	58Ω								Vert. Deflection Coils
T6	420Ω		T10-560	FC-11	MF-2	TC-2 ⑨	B-470-R		Focus Coil
T7	37Ω		T10-561	WC-5 ⑩ ⑪	MWC-1 ⑩ ⑪	TWL-1	WC-11 ⑫		Horiz. Linearity Coil
T8	.6Ω		T10-551	WC-1		TW-1		20IR1	Width Coil

① Drill one new mounting hole.
② See instruction sheet packed with unit for terminal connections
③ Use with width coil TW-6
④ Wire as in original circuit, except, connect original #7 to new #7, connect TW-6, primary across #5 and #8, connect secondary to AFC (if picture is out of phase, reverse secondary).
⑤ Use with width coil WC-11.
⑥ Connect terminal "P" to #2. Original terminal #4 to new terminal #4, original #5 to new #5, original #6 to new #8, original #7 to new #6, connect WC-11 primary to #5 and #8 and secondary to AFC (if picture is out of phase, reverse secondary).
⑦ Use original horizontal deflection coil network if necessary.
⑧ Use original deflection coil network.
⑨ Fabricate new mounting bracket.
⑩ Enlarge mounting hole.
⑪ Do not use secondary.
⑫ Connect to coded blue and red terminals.
⑬ Use with width coil 216R1.
⑭ Use Fig. 1 of instruction booklet packed with unit for terminal connections.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T9	5.4Ω	3.6Ω	260Ω	.44Ω	80-253	A-3849	A-3019	RO-9 ①	S-5X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Silvertone PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	8"	PM	3.6Ω	79-399	ST-115 Mod. P8-V	8A21	① 6" Speaker used on model 3115.
B	6"	PM	3.6Ω	79-398 ①	ST-108 Mod. P6-X	6A1	② 5" Speaker used on models 3110, 3110A, and 3115A.
C	5"	PM	3.6Ω	79-397 ②	ST-105 Mod. P5-X	5A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	0Ω CT	0Ω					
L2	Fil.Choke	0Ω						
L3	Neutr.Coil	0Ω						
L4	RF, Mixer Grid & Osc. Coils	0Ω						
L5	Fil.Choke	0Ω						
L6	RF Choke	0Ω						
L7	1st.Video IF	1Ω						
L8	RF Choke	1.2Ω						

SILVERTONE MODELS 3110, A, 3115, A, 3160, A
(Ch. 528.242, -1, -2, 528.248, -1, -2)

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	REPLACEMENT DATA MEISSNER PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA MILLER PART No.	NOTES
L9	Fil. Choke	0Ω						Not used in all Models.
L10	Accompanying Sound Trap	0Ω	.1Ω	T10-574	20-1021	TV-150 *	6193 *	
L11	2nd. Video IF	.3Ω	.3Ω	T10-541	17-1062		6250	
L12	3rd. Video IF	.3Ω	.3Ω	T10-542	17-1063		6249	
L13	4th. Video IF	.3Ω	.3Ω	T10-577				
L14	Fil. Choke	0Ω						Not used in all Models.
L15	Series Peaking Coil	6.5Ω		T10-557	19-3093	TV-181	6177	90 Microhenries
L16	Shunt Peaking Coil	14Ω		T10-579	19-3500	TV-188	6174	550 Microhenries
L17	Series Peaking Coil	6.5Ω		T10-580	19-3180 †	TV-184 †	6180 †	175 Microhenries, wound on 8.2KΩ resistor
L18	4.5MC Trap	3.5Ω		T10-581	20-1004	TV-151	1469	Silvertone part number includes C39
L19	Shunt Peaking Coil	11Ω		T10-578	19-4412		4648 ▲	410 Microhenries, wound on 10KΩ resistor
L20	Sound IF	1Ω		T10-556	17-3400	TV-151	1469	Silvertone part number includes C45, C46, and C47.
L21	Ratio Det.	3.8Ω	.3ΩCT	T10-552	17-1033 ■	TV-110 ■	1468 ■	Tertiary winding -.85Ω
L22	Horiz. Osc.	55Ω		T10-555	19-1576	TV-163	6210	Silvertone part number includes C73 and R76

* Enlarge mounting hole.
† Parallel with 8.2KΩ resistor
▲ Parallel with 10KΩ resistor
■ Drill mounting holes and disconnect C49.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA SILVERTONE PART No. FUSE	SILVERTONE PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5 Amp. 250V.	T43-12	T87-44	312 005. (3AG 5A.)	341001	MTH5	HKP
M2	3AG	.25 Amp. 250V.	T43-13		318. 250 (3AG 1/4A. P/T)		GJV1/4	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	RF Tuner	T95-30	
M4	Ion Trap	T83-684	
B2	Trimmer Cap.	T20-145	Horiz. Drive
	Cabinet	T42-548	Model 3110
	Cabinet	T42-551	Model 3110A
	Cabinet	T42-518	Model 3115
	Cabinet	T42-550	Model 3115A
	Cabinet	T42-516	Model 3160
	Cabinet	T42-549	Model 3160A
	Safety Glass	T48-64	Models 3110, 3110A
	Safety Glass	T48-61	Models 3115, 3115A
	Safety Glass	T48-60	Model 3160, 3160A
	Cabinet Back	T32-24	Models 3110, 3110A
	Cabinet Back	T32-21	Models 3115, 3115A
	Cabinet Back	T32-22	Models 3160, 3160A
	Knob	T52-399	Channel Selector Models 3110, 3110A, 3115, 3115A
	Knob	T52-395	Channel Selector Models 3160, 3160A
	Knob	T52-400	Fine Tuning, Models 3110, 3110A, 3115, 3115A
	Knob	T52-396	Fine Tuning, Models 3160, 3160A
	Knob	T52-401	Contrast, Models 3110, 3110A, 3115, 3115A
	Knob	T52-397	Contrast, Models 3160, 3160A
	Knob	T52-402	Off/On/Volume, Models 3110, 3110A, 3115, 3115A
	Knob	T52-398	Off/On/Volume, Models 3160, 3160A
	Escutcheon	T84-717	Front cover controls, Models 3110A, 3115A, 3160A

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST
DENVER, COLO

AUDIO

WEAK OR NO SOUND

Check by substitution V9, V10 and V11. Check stages of V10B and V11 using audio signal generator. Apply signal across R46.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF alignment and circuit components.	Check components associated with V10B and V11 especially C56, T9 and SP1.

BUZZ

Readjust ratio detector secondary A8 for minimum buzz. If buzz is still objectionable, substitute V10 and readjust A7 and A8. Check C8 and other components associated with V10A.

DISTORTED

Check by substitution V9, V10 and V11. Check stages of V10B and V11 using audio signal generator and scope. Apply audio signal across R46. Connect scope across the secondary of T9.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF components and alignment.	Check components associated with V10B and V11 especially C56, T9 and SP1.

POWER

DEAD SET

If filaments fail to light, check fuse M1, AC interlock assembly, switch on volume control and T1. If filaments light, check V20 and components of the B+ filter and decoupling network.

SMALL AND/ OR DIM RASTER

Substitute V20. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M2. Check by substitution V16, V17, V18 and V19. Check waveform at W16.

If Satisfactory	If Unsatisfactory
Check C79, C80, C81, C82, R85, R86, T3, T5A and other associated circuit components.	Check C74, C76, C77 and other components associated with V16.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V16, V17, V18, V19 and V20. Check picture tube and associated components. Proceed as outlined under "Loss of high Voltage".

BLOOMING

Check by substitution V16, V17, V18 and V19. Check R85, R86, C82, T3, T5A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video ".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6, V7 and V11. Check associated circuit components, especially those associated with V11.

NO RASTER NO SOUND

See "Dead Set".

TOTAL LOSS OF SYNC

Substitute V12. Check associated components, especially all coupling and bypass capacitors.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the channel selector shaft.

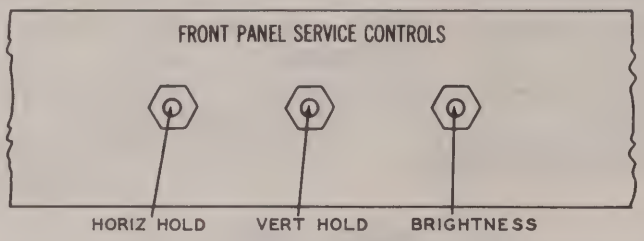
PICTURE TUBE SAFETY GLASS CLEANING

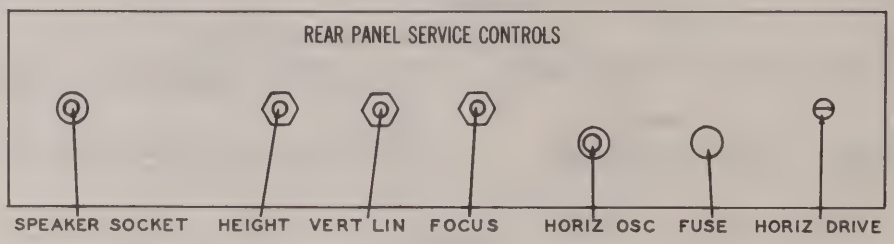
To clean safety glass remove 4 wood screws holding wood strip at top of cabinet. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION





HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis. Set the horizontal hold control at the mid-position of its range and adjust the horizontal oscillator slug (L22) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L21) located on top of chassis. (See tube placement chart).

FUSES

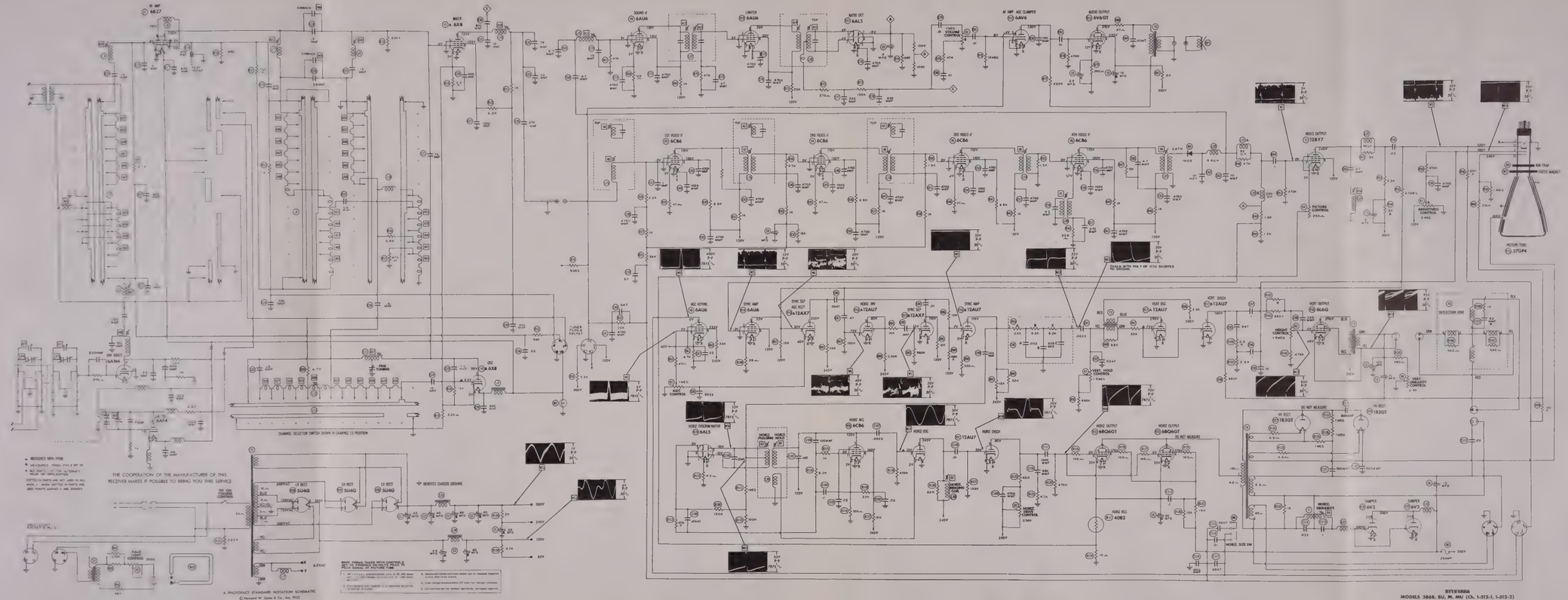
Two fuses are used. One for horizontal sweep circuit protection and one for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by positioning the focus coil. Adjust the three nuts located on the focus coil bracket until picture is properly centered.

DISASSEMBLY INSTRUCTIONS

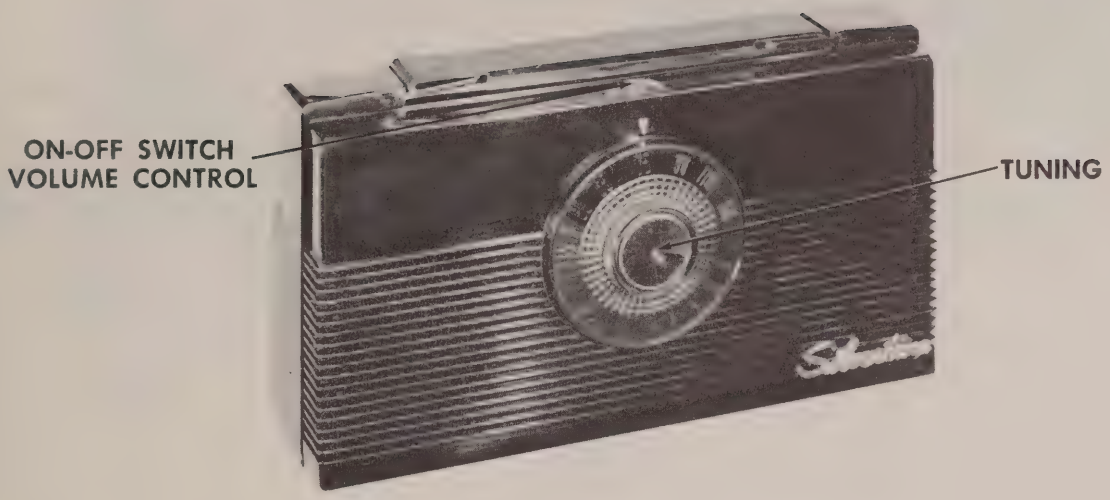
1. Remove 4 push on type control knobs from front panel.
2. Loose 7 wood screws. Lift rear cover up and remove.
3. Disconnect built-in antenna. Remove 2 wood screws. Remove antenna strip.
4. Disconnect speaker. Remove 4 speaker nuts. Remove speaker.
5. Remove 4 chassis bolts. Remove chassis.



SYLVANIA
MODELS 386B, BU, M, MU (Ch. 1-512-1, 1-512-2)

PROPERTY OF
L. F. BLANK
3921
DE

SILVERTONE
MODEL 3210 (Ch. 528.241)



SILVERTONE
MODEL 3210 (Ch. 528.241)

TRADE NAME	Silvertone Model 3210 (Ch. 528.241)
SUPPLIER	Sears Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	Battery Operated Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	1.5 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	250MA @ 1½ Volts DC & 13MA @ 67½ Volts DC
TUNING RANGE—BROADCAST	540-1625KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	4	50	T18-292	PRS150/4		BBR4-50T		TC30	TVA-1402	
C2	20000		T15-240	BPD-02	DD-203				5HK-S2	
C3	47		T15-229	BPD-000047	D6-470		GP1K-470	UC-5447	5GA-Q47	
C4	5000		T16-177	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C5A	150									
B	.002									
C	150		♦ T17-105		♦PC-160					
D	.01									
E	.005									
C6	1000		T15-220	BPD-005	MD-502	TM5D5	811-005	DC-525	5HK-D5	

♦ Items C5A, C5B, C5C, C5D, C5E, R5A, R5B, R5C, R5D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Silvertone PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	T24-205	Q13-137	AG-63-Z		U-53	Volume-Note
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2		US-27	Attach to R1A

Note: Some Models use alternate control (part #T24-204)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Silvertone PART No.	IRC PART No.	
R2	100KΩ	½	T60-727	BTS-100K	
R3	10Meg	½	T60-728	BTS-10Meg	
R4	2.2Meg	½	T60-726	BTS-2.2Meg	

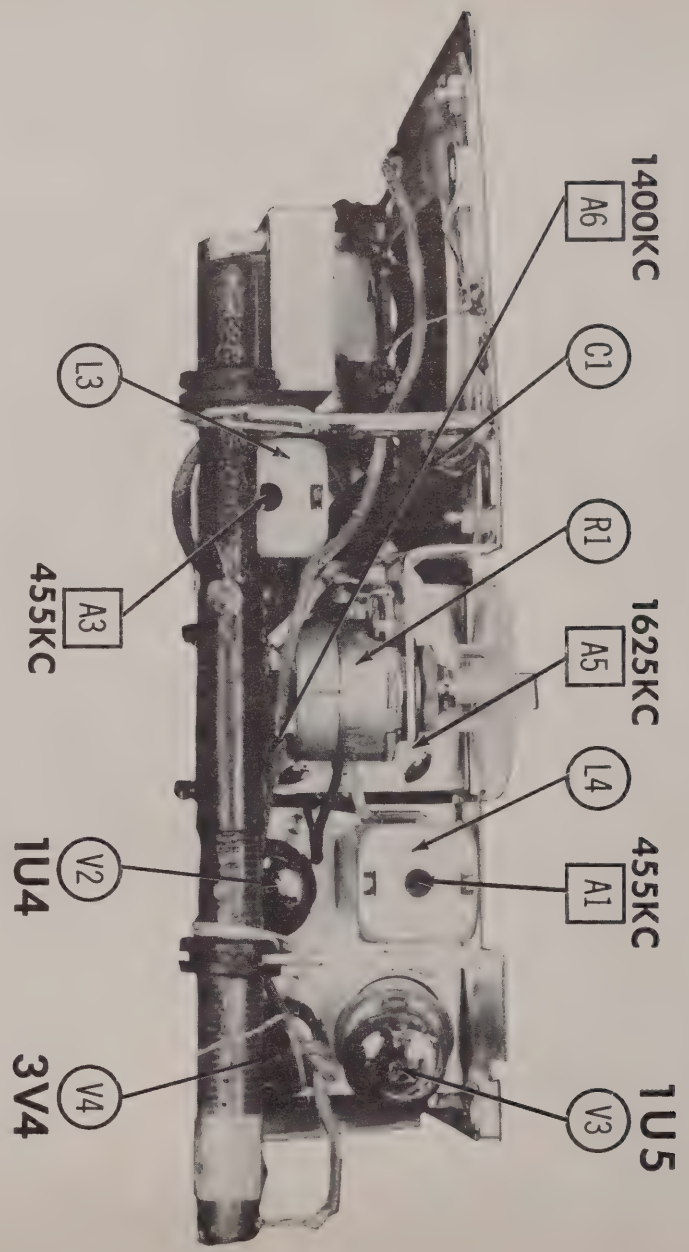
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Silvertone PART No.	IRC PART No.	
R5A	10Meg	½	♦T17-105	BTS-10Meg	
B	4.7Meg	½		BTS- 4.7Meg	
C	1Meg	½		BTS-1Meg	
D	3.3Meg	½		BTS-3.3Meg	
C6	270Ω	½	T60-771	BTS-270	

♦ Items R5A, R5B, R5C, R5D, C5A, C5B, C5C, C5D, C5E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.5KΩ	3.1Ω	364Ω	.32Ω	T60-281		A-2998 ①		S-11X ①	① Bend mounting tabs down, file out slots, mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SILVERTONE PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.1Ω	T79-407	35J4	3A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	.6Ω		T82-77				
L2	Osc. Coil	1.8Ω	8.5Ω	T10-584	14-1074		71-Osc.	
L3	Input IF	20Ω	20Ω	T10-508	16-6758	BC-352	12-C1	
L4	Output IF	20Ω	20Ω	T10-508	16-6758	BC-353	12-C2	

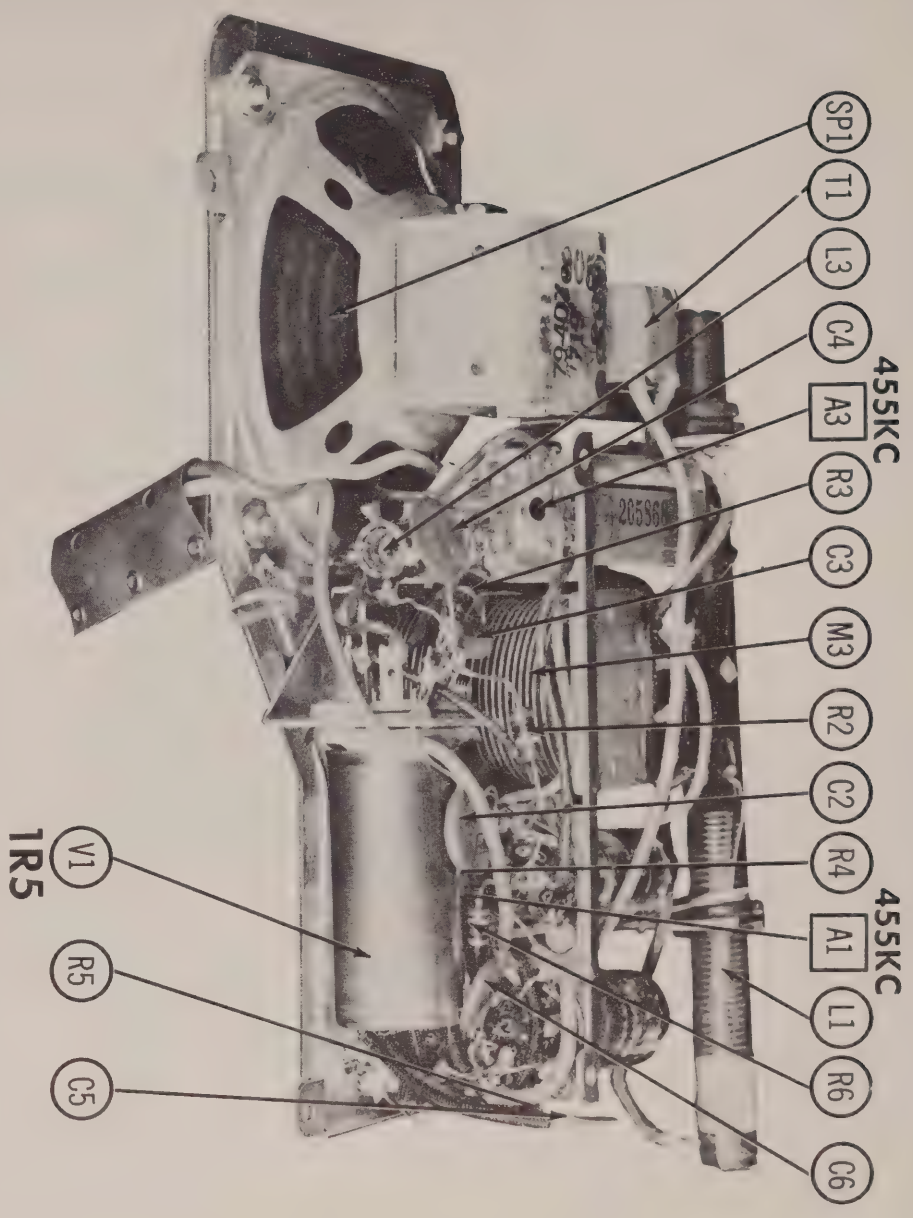
BATTERIES

ITEM No.	VOLTAGE	SILVERTONE PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1½V.	6442	964			2IR			Two in parallel
M2	67½V.	6482		477			P45		

MISCELLANEOUS

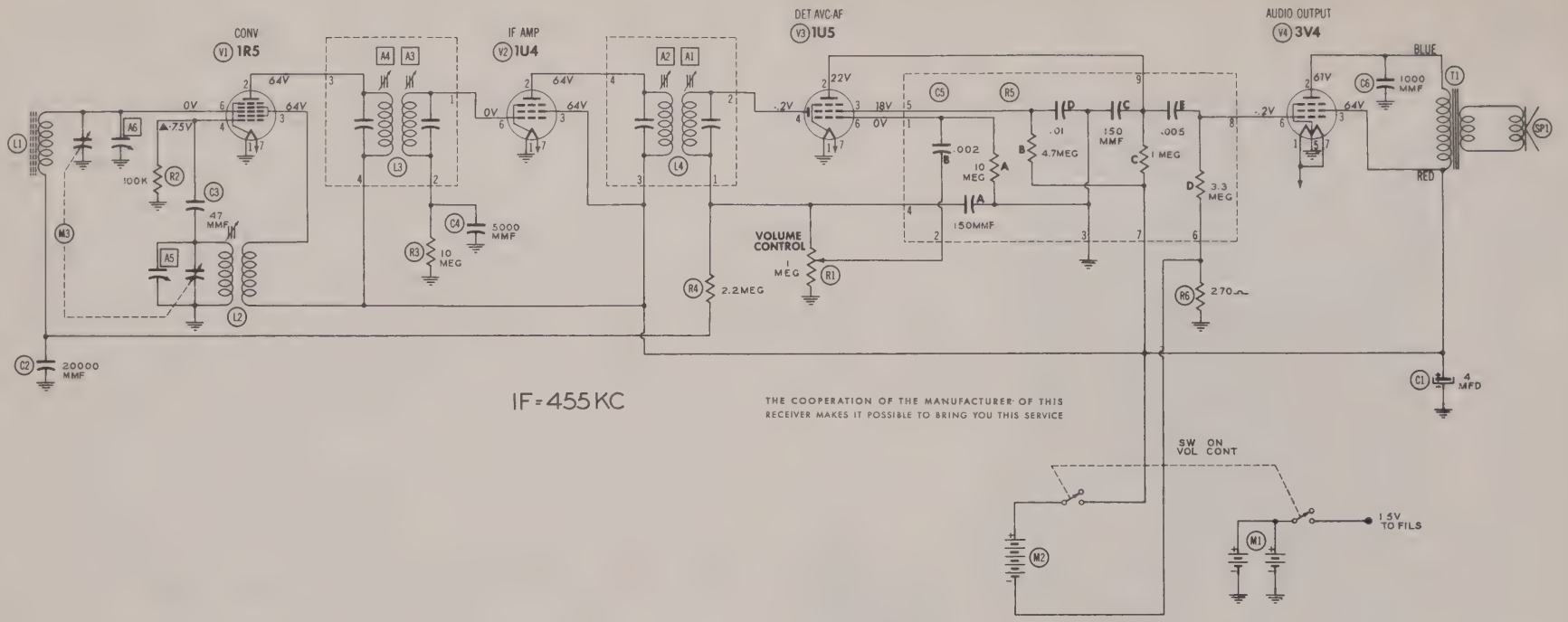
ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M3	Tuning Cap.	T19-228	27-320MMF, 21-135MMF
	Cabinet	T42-540	
	Cover	T42-541	
	Handle	T53-14	
	Knob	T52-394	Tuning
	Knob	T52-393	Off/On/Volume

CHASSIS—BOTTOM VIEW



SILVERTONE
MODEL 3210 (Ch. 528.241)

SILVERTONE
MODEL 3210 (Ch. 528.241)



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†20Ω	†1.8Ω	100KΩ	*	3.2Meg	*
V 2	1U4	*	†20Ω	†0Ω	3.2Meg	*	10Meg	*
V 3	1U5	*	†1Meg	†4.7Meg	1Meg	10Ω	10Meg	*
V 4	3V4	*	†365Ω	†0Ω	270Ω	*	3.3Meg	*

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN #3 OF V4 (B+)

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5 - Volume control maximum, no signal applied for voltage measurements.

PROPERTY OF
L. F. [illegible]
[illegible]
DE[illegible]

SPARTON
MODELS 342, 345, 347 (Ch. 5C3)

SPARTON
MODELS 342, 345, 347 (Ch. 5C3)

SPARTON MODEL 345

TRADE NAME	Sparton Models 342, 345, 349 (Ch. 5C3)
MANUFACTURER	Sparks-Withington Co., Jackson, Mich.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES(Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC/DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B- . Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	456KC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1500KC	1500KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. If necessary adjust trimmer on opposite side of stator plates.
3.		"	"	"	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.	Repeat Steps 1 and 2.						
5.	Check calibration at 600, 1000 and 1500KC.						
	With tuning gang fully closed, set dial pointer at the low frequency index mark on the dial.						

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SPARTON PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AV6	12AV6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SPARTON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150	PA431l	PRS150/50-40		EDL-5515			TVA-2453	Yellow
B	40	150								Red
C2	.05	200	PC40GK-503	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	33		PA4347-2		TCN-33				5TCU-Q33	
C4	150		PA4347-5							
C5	10		PA4347-7	SIl0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q3	
C6	.05	400	PC40HL-503	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C7	3000		HK35F-302	SI3000	D6-302	TM5D3	GP2-333-302	UC-525	5HK-D3	
C8A	100		*PA4329-1	*PA-97	*PC50		*1403-01		*100C1	
B	100									
C9	2000		PA4334-3	BPD-002	DD-202	TM5D2	GP2-333-202	DC-522	5HK-D2	
C10	2000		PA4334-3	BPD-002	DD-202	TM5D2	GP2-333-202	DC-522	5HK-D2	
C11	10000		PA4334-2	BPD-01	D6-103	TM5D1	GP2-333-103	DC-511	5HK-S1	
C12	5000		PA4334-1	BPD-005	D6-502	TM5D5	GP2-333-502	DC-525	5GA-D5	
C13	.1	400	PC-40FL-104	P488-1		PTE4P1		PT401	4TM-P1	

* C8A, C8B and R8 are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SPARTON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	PA4400-11	Q13-133	AG-60-Z	BSK-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

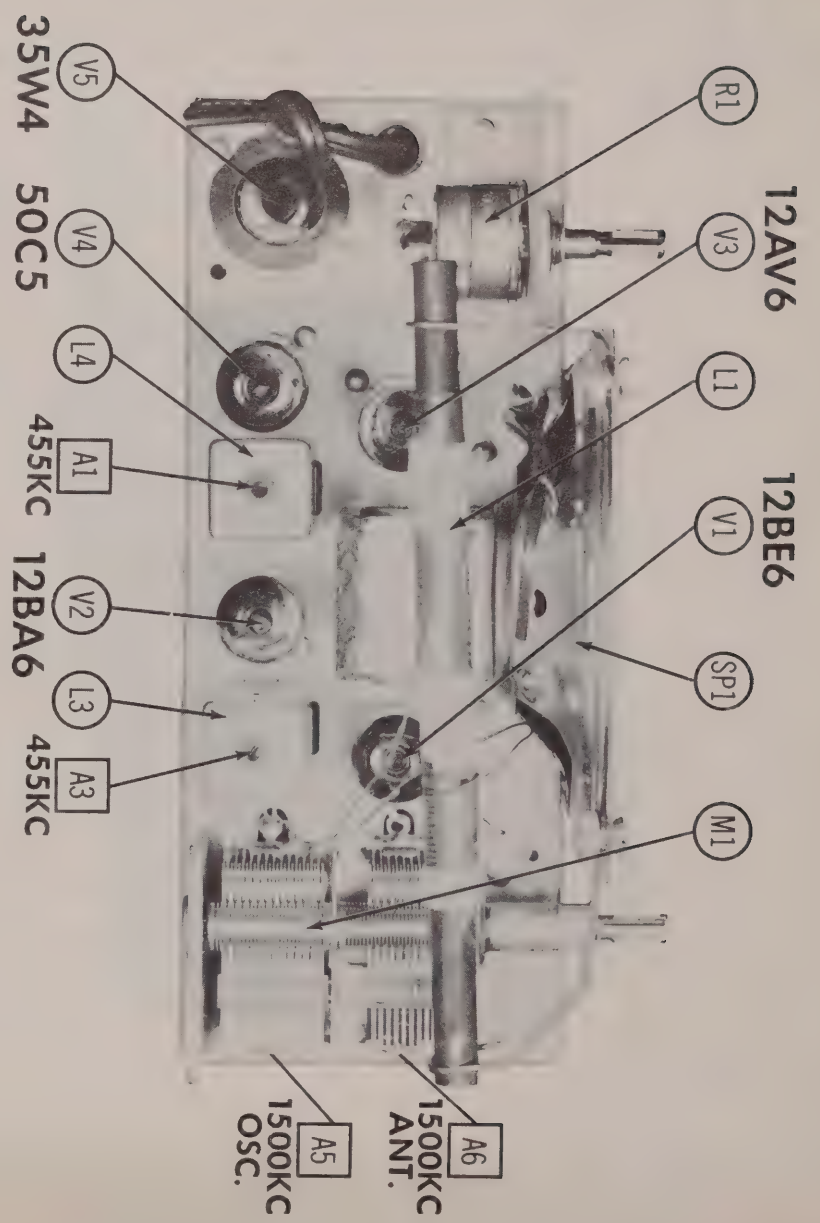
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTON PART No.	IRC PART No.	
R2	22KΩ	½	BR12S-223	BTS-22K	
R3	1Meg	½	BR12N-105	BTS-1Meg	
R4	47Ω	½			Note
R5	68Ω	½	BR12S-680	BTS-68	
R6	470Ω	½	BR12S-471	BTS-470	
R7	2.2Meg	½	BR12N-225	BTS-2.2Meg	
R8	47KΩ	½	*PA4329-1	BTS-47K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SPARTON PART No.	IRC PART No.	
R9	10Meg	½	BR12N-106	BTS-10Meg	
R10	220KΩ	½	BR12S-224	BTS-220K	
R11	470KΩ	½	BR12N-474	BTS-470K	
R12	150Ω	½	BR12S-151	BTS-150	
R13	1200Ω	1	CR12S-122	BTA-1200	
R14	68Ω	1	CR12S-680		

* Items R8, C8A, C8B are combined in one unit.
Note: Some Models may use a 22Ω resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		SPARTON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.5KΩ	3.3Ω	180Ω tap @ 6Ω	.4Ω	AB44068-1	A-3330	A-3031	RO-3		

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SPARTON PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	PC63000-23	ST-113 Mod. P4-X	4A1	

COILS (RF-IF)

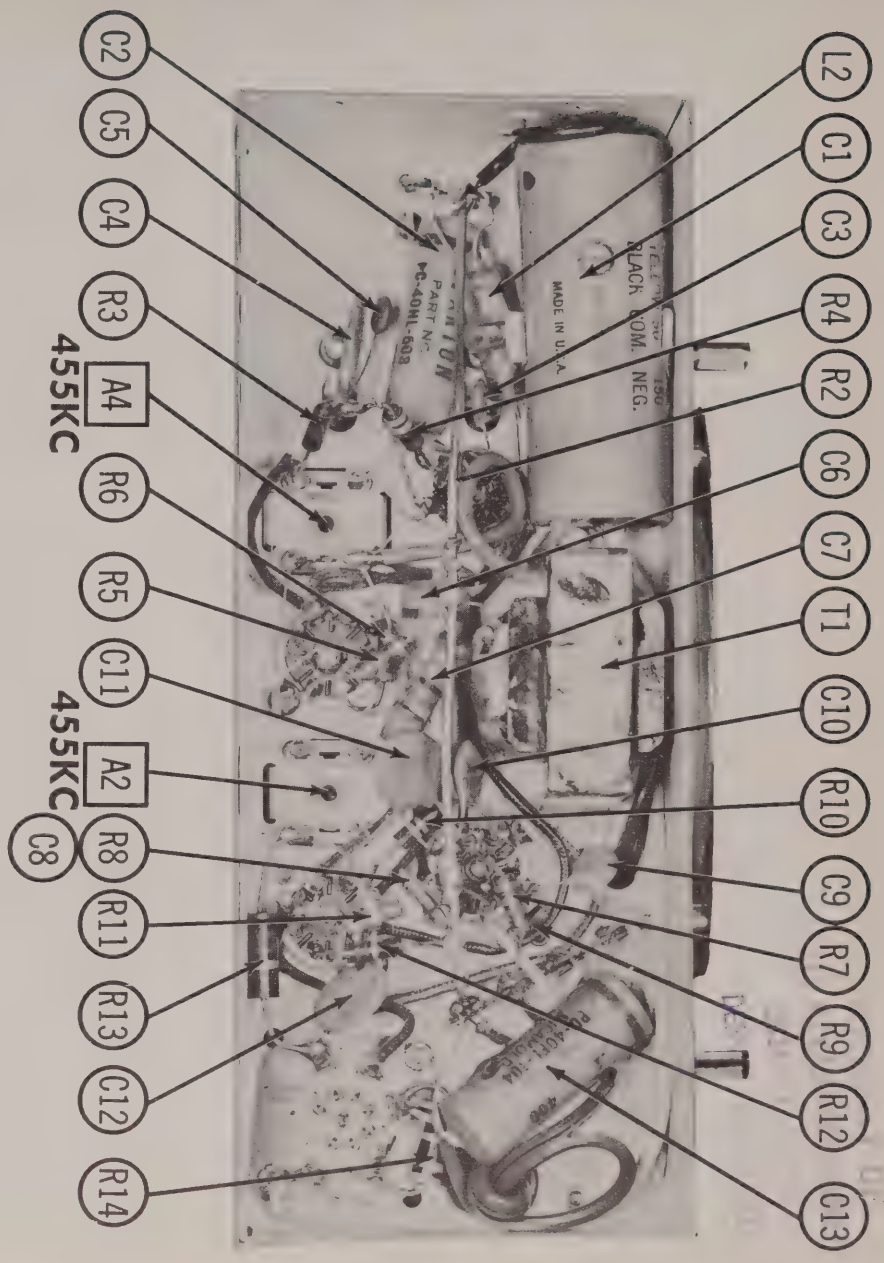
ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SPARTON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.2Ω		AB43592-2				
L2	Osc. Coil	.5Ω	5Ω	AA6797-5	14-1074		70-Osc. *	
L3	Input IF	15Ω	15Ω	PB42201-3	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	PB42201-3	16-6758	BC-353	12-C2	

* Disregard tap on secondary winding.

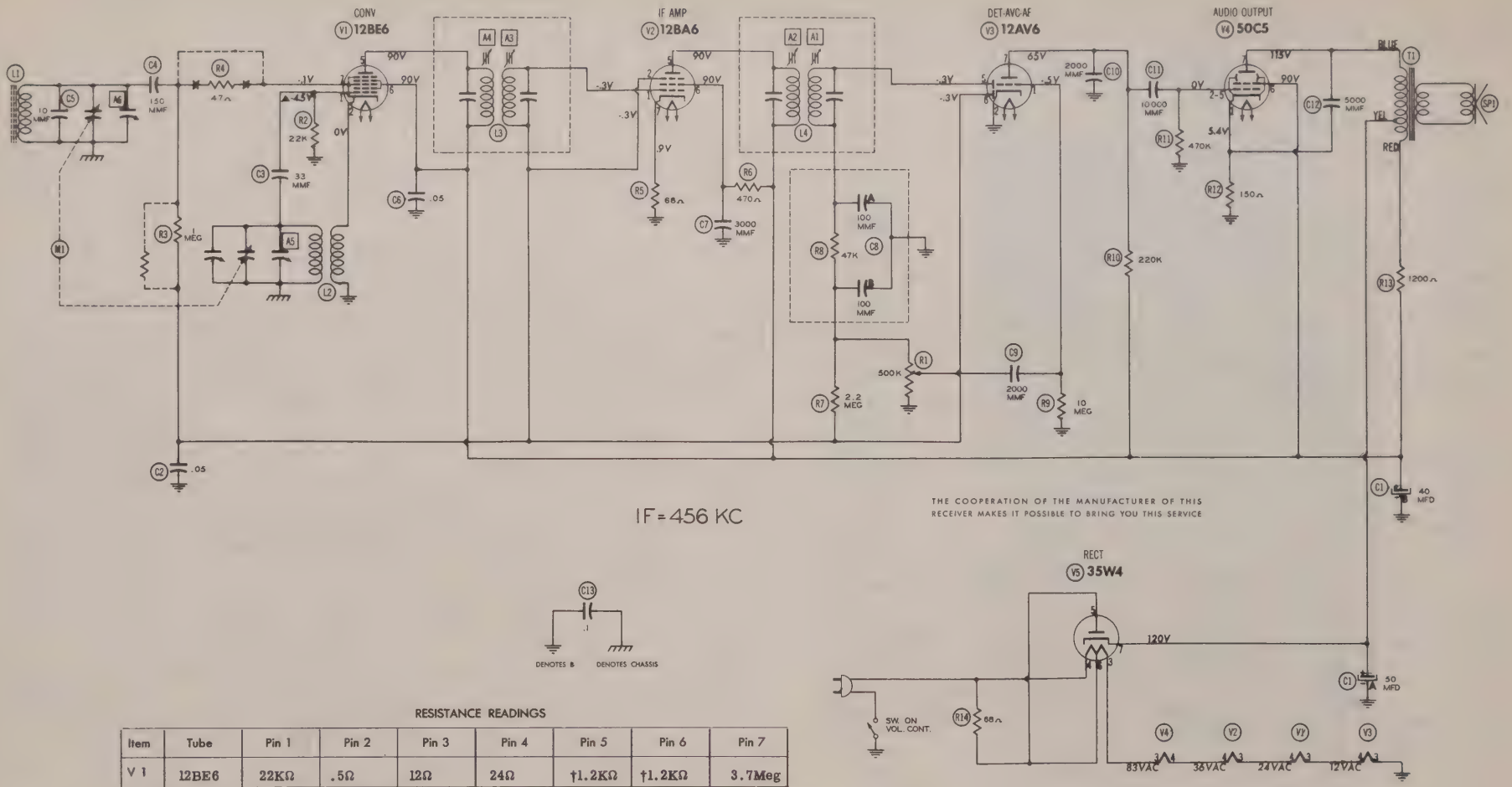
MISCELLANEOUS

ITEM No.	PART NAME	SPARTON PART No.	NOTES
M1	Tuning Cap.	PB40418	43-382MMF, 24-185MMF
	Cabinet	PD90124-1	Red
	Cabinet	PD90124-2	Green
	Cabinet	PD90124-3	Ivory
	Knob (Dial Scale)	PA5666	
	Knob	PA5665	Off/On/Volume
	Knob	PA5650	Tuning

CHASSIS—BOTTOM VIEW



SPARTON
MODEL 345 (Ch.5C3)



IF = 456 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	3.7Meg
V 2	12BA6	2.7Meg	2.7Meg	24Ω	36Ω	†1.2KΩ	†1.7KΩ	68Ω
V 3	12AV6	10Meg	0Ω	0Ω	12Ω	550KΩ	2.7Meg	†220KΩ
V 4	50C5	150Ω	470KΩ	85Ω	36Ω	470KΩ	†1.2KΩ	†175Ω
V 5	35W4	INF	†6Ω	85Ω	120Ω	114Ω	114Ω	300KΩ

▲ TAKEN WITH VACUUM TUBE VOLTMETER
† MEASURED FROM PIN 7 OF V5

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SYLVANIA
MODELS 386B, BU, M, MU (Ch. 1-512-1, 1-512-2)

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MODEL 386M

SYLVANIA
MODELS 386B, BU, M, MU (Ch. 1-512-1, 1-512-2)

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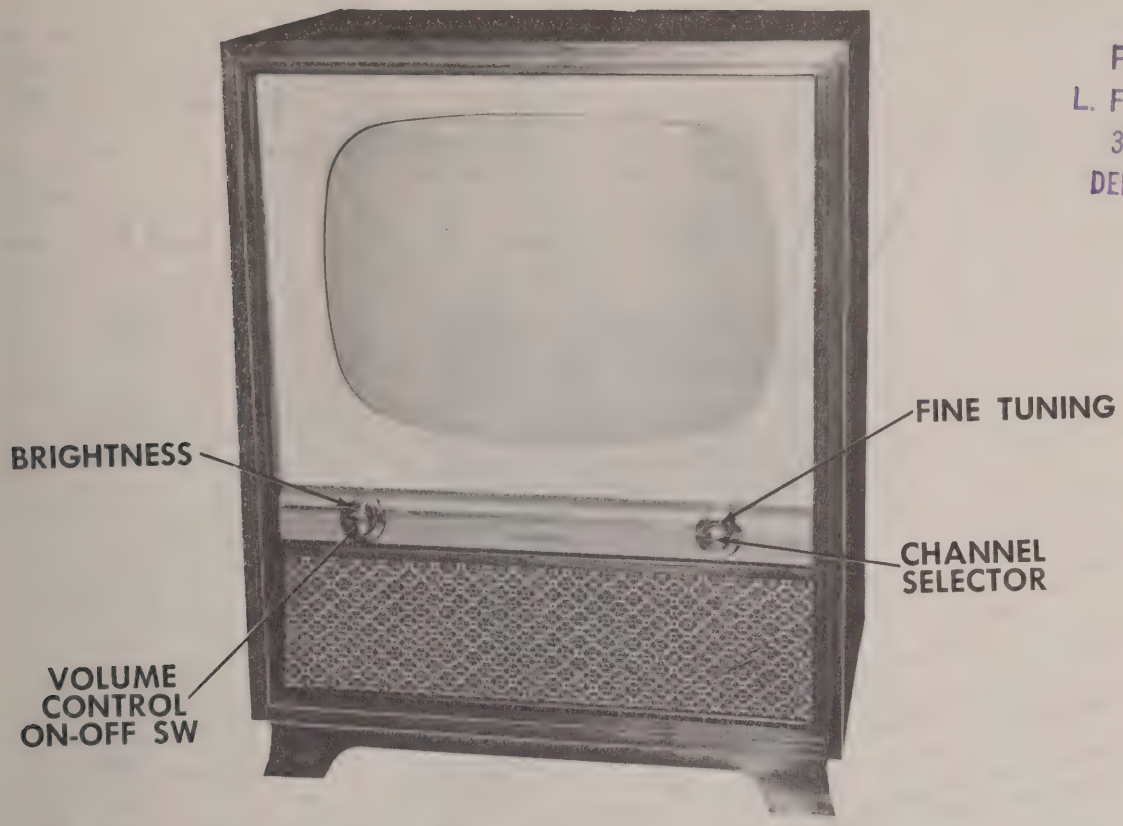

SYLVANIA MODELS
386B, BU, M, MU (Ch. 1-512-1, 1-512-2)

SYLVANIA MODEL 386M

TRADE NAME	Sylvania Models 386B, 386BU, 386M, 386MU (Ch. 1-512-1, 1-512-2)
MANUFACTURER	Sylvania Electric Prod., Inc., Radio & Television Div., 254 Rano St., Buffalo, N.Y.
TYPE SET	Television Receiver
TUBES	Thirty-one
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.86 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

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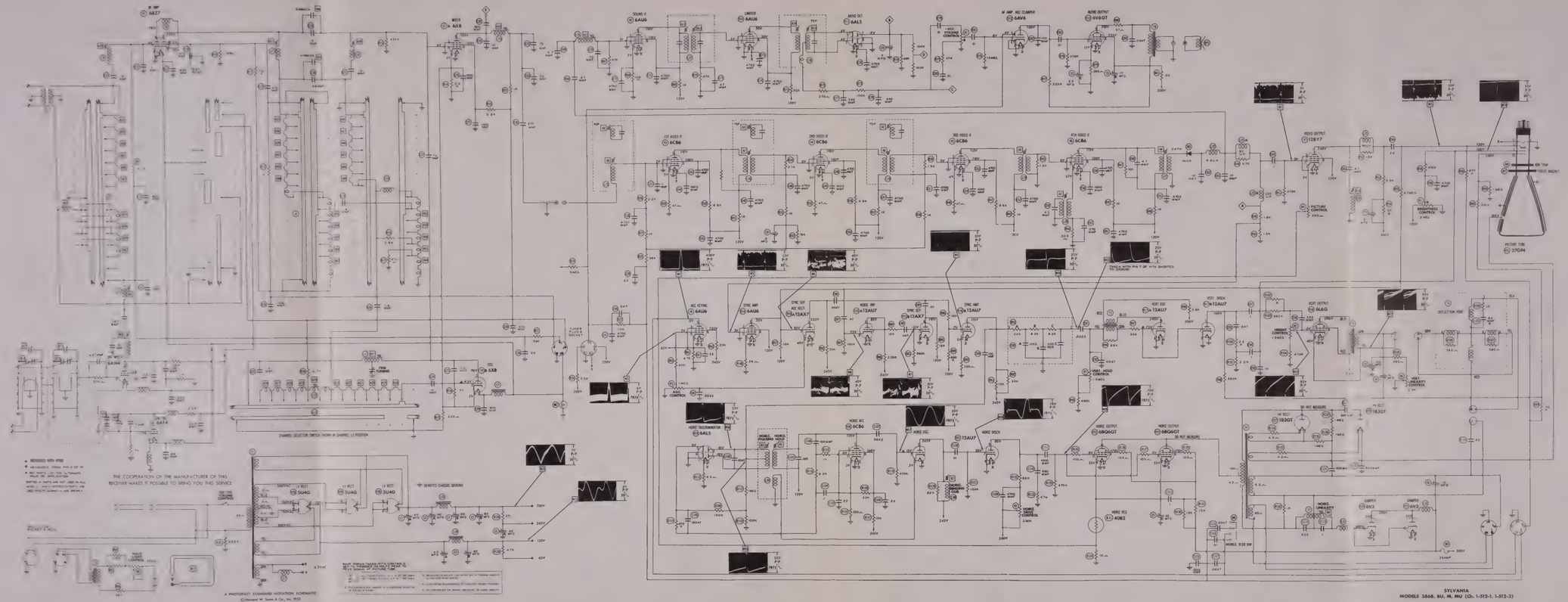
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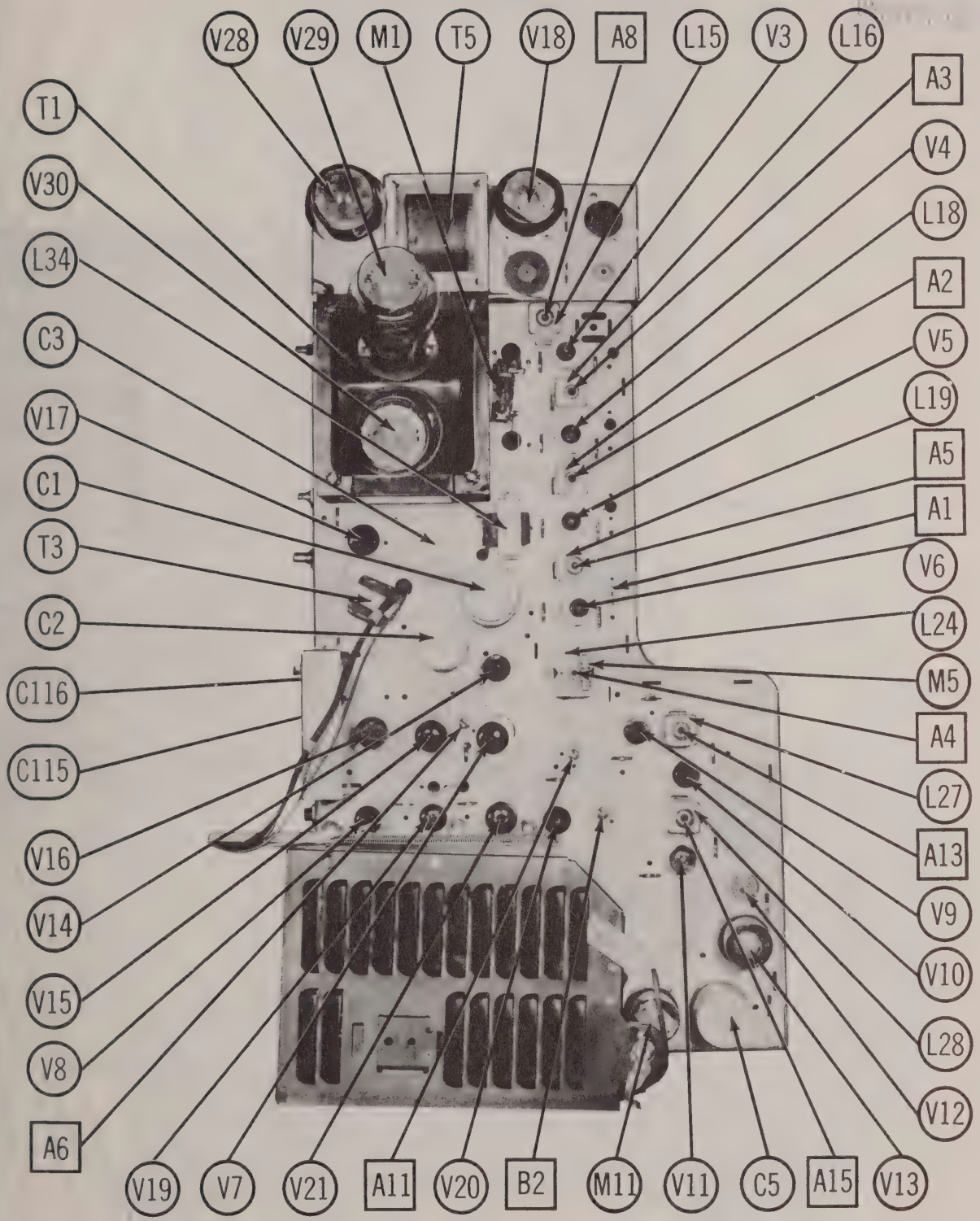
MODELS 386B, BU, M, MU (Ch. 1-512-1, 1-512-2)



CHASSIS TOP VIEW

PROPERTY OF

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MODELS 3898, BU, W, MU (Ch. 1-512-1, 1-512-2)

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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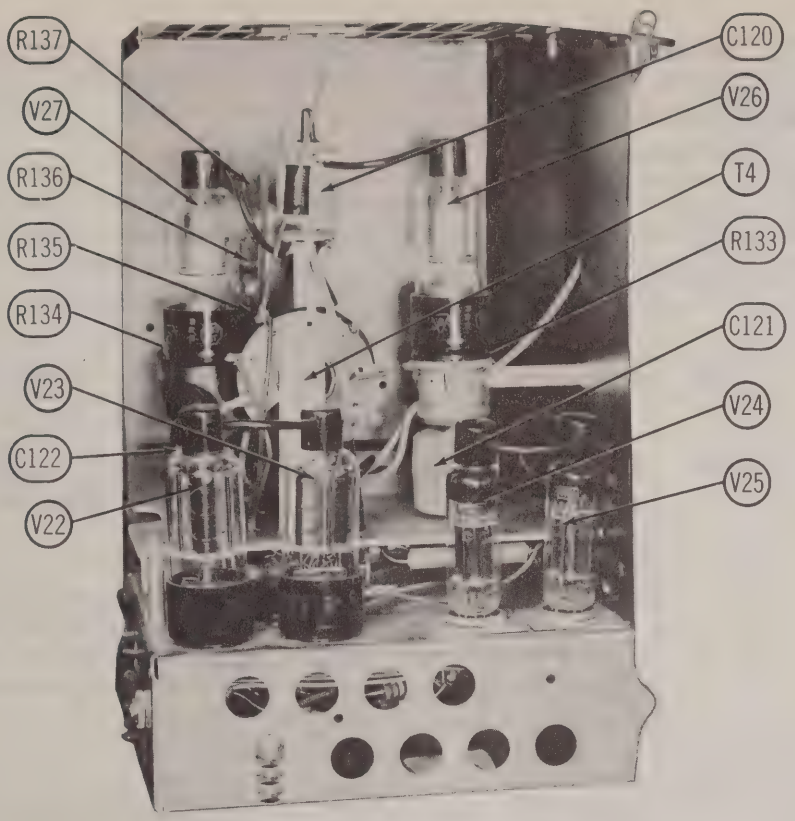
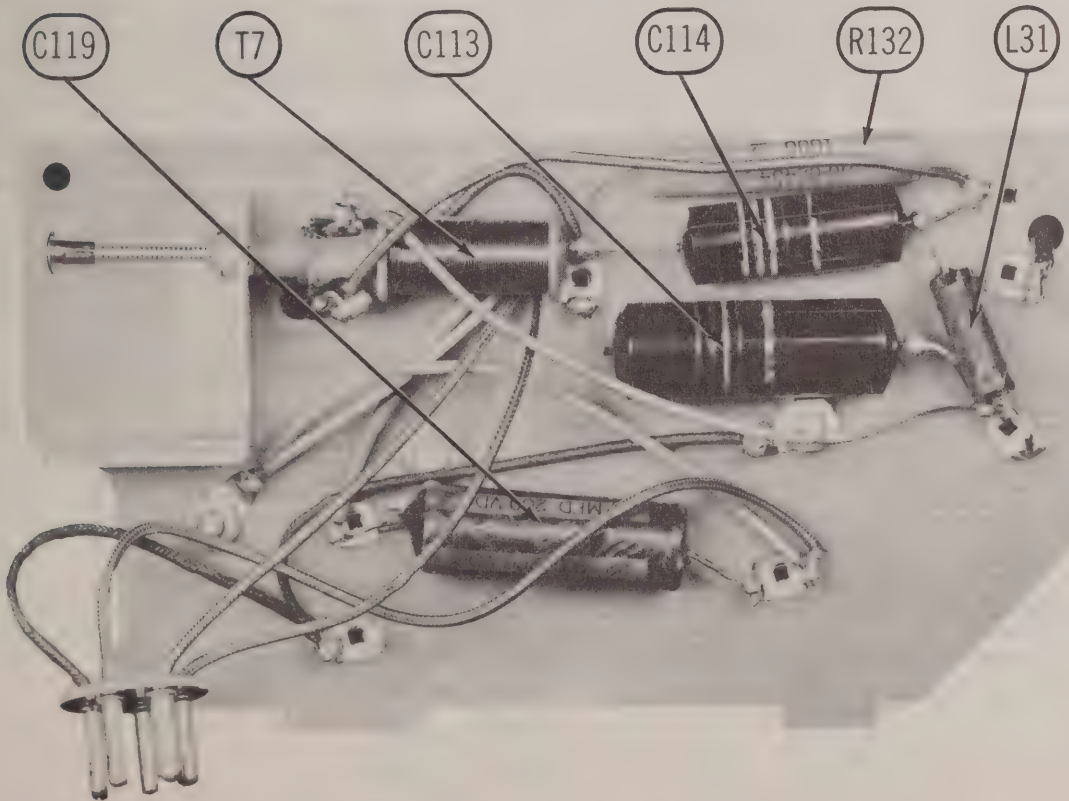


HIGH VOLTAGE COMPARTMENT



HIGH VOLTAGE SUB-CHASSIS

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Securely tape the high voltage lead and keep away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

The shorting bar on the high voltage shield must be in a foward position during alignment.
Connect the tuner chassis to the main chassis.
The VHF tuner cover must be in place during alignment.
Use non-metallic alignment tools.
Allow 15 minute warm-up period for receiver and test equipment.
If the marker generator is separate unit from the sweep generator, the marker signal may be injected into the control grid (pin 7) of the 6X8 (V2) by connecting a short piece of insulated wire to pin 7.
Connect the negative lead of a 3 volt bias battery to the ungrounded side of C39. Connect the positive side of the battery to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over 6X8 (V3), Low side to chassis.	Not used	39.75MC	Any unused channel	Use VTVM. DC probe to point (A). Common to chassis.	A8	Adjust for MINIMUM deflection.
2.	.001MFD	High side to pin 7 (grid) of 6X8 (V2). Low side to chassis.	43.25MC (10MC Swp)	45.7MC 42.1MC	Any unused high channel	High side thru detector (Fig.3) to pin 2 (cathode) of 6CB6 (V3). Low side to chassis.	A9, A10	Remove bias battery. Short pin 5 to pin 6 on V3. Replace V2 shield to normal position Adjust A9 and A10 for response curve similar to Fig. 1. ... Remove short from V3.
3.	Direct	High side to an ungrounded tube shield floating over 6X8 (V2). Low side to chassis.	Not used	41.25MC	Any unused channel	Use VTVM. DC probe to point (A). Common to chassis.	A1	Connect negative lead of a 3 volt battery to ungrounded side of C39. Positive lead to chassis. Adjust for MINIMUM deflection.
4.	"	"	"	47.25MC	"	"	A2	"
5.	"	"	"	41.25MC	"	"	A3	"
6.	"	"	"	44.0MC	"	"	A4	Reduce signal generator output to maintain 1 to 2 volt reading on VTVM. Adjust for maximum deflection.
7.	"	"	"	42.0MC	"	"	A5	"
8.	"	"	"	45.2MC	"	"	A6	"
9.	"	"	"	43.2MC	"	"	A7	"
10.	Repeat steps 3, 4 and 5.							
11.	Direct	High side to an ungrounded tube shield floating over 6X8 (V2). Low side to chassis.	43.25MC (10MC Swp)	41.25MC 42.1MC 45.75MC 47.25MC	Any unused channel	Vert. Amp. thru 33KΩ to point (A). Low side to chassis.	A4, A5, A6, A7	If necessary, SLIGHTLY retouch A4 thru A7 for maximum flat-topped response with band width and marker placement similar to Fig. 2.

SOUND IF ALIGNMENT

Connect two matched 100KΩ (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (A) as shown on the schematic.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Replace the tube shield of V2 if removed during Video IF alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.	1000Ω Resistor	High side to pin 1 (grid) of 6CB6 (V3). Low side to chassis.	4.5 MC (10MC Swp)	4.5MC (Use crystal marker if available)	Any	DC probe to ungrounded side of R70. Common to chassis.	A11, A12 A13	Adjust for maximum deflection.
13.	"	"	"	"	"	DC probe to point (A). Common to chassis.	A14	Adjust for maximum deflection. Attenuate generator to maintain not more than 1 volt at VTVM.
14.	"	"	"	"	"	DC probe to point (C). Common to point (D).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

ALTERNATE SOUND IF ALIGNMENT

Connect a suitable antenna to the receiver.
Replace the tube shield of V2 if removed during Video IF alignment.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
12.		Not used	Not Used	Strongest TV station available	DC probe to ungrounded side of R70. Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
13.		"	"	"	DC probe to point (B). Common to chassis.	A14	Adjust for maximum deflection. SLIGHTLY retouch A11, A12 and A13 to obtain maximum deflection.
14.		"	"	"	DC probe to point (C). Common to point (B).	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
15.	.001MFD	High side to pin 3 (grid) of 12BY7 (V8). Low side to chassis.	4.5MC	Any	DC probe thru detector (Fig. 3) to pin 11 of picture tube. Common to chassis.	A15	Short pin 1 (grid) of 6CB6 (V6) to chassis. Adjust for MINIMUM deflection. Remove short on pin 1.

FIG. 1

FIG. 2

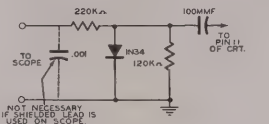


FIG. 3

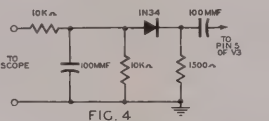


FIG. 4

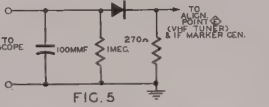


FIG. 5

ACCEPTABLE RESPONSE CURVES

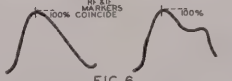


FIG. 6

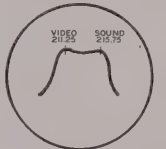


FIG. 7

VHF TUNER ALIGNMENT

Connect the negative lead of a 3 volt battery to terminal #8 on the tuner. Connect positive lead to chassis.
Remove 2nd Video IF tube V4 from its socket.
Disconnect the primary winding of L16 from pin 5 (plate) of 6CB6 (V3), and connect a 330Ω resistor from the B+ end of L16 to pin 5 of V4.
During alignment, the use of two marker generators is required. Generator #1 (IF) is connected through a 2 or 3 MMF capacitor to the input of detector probe (See figure 8). Marker generator #2 (RF) is connected through a 2 or 3 MMF capacitor across the sweep generator at the antenna terminals. If the sweep generator has a built-in marker generator, is should be used for marker generator #2.
Since it is necessary during the tuner alignment to switch the oscilloscope vertical input between the IF detector circuit (Fig. 4) (which is connected to pin 5 of V3 (Alignment point (F)) and the RF detector circuit (Fig. 5)(which is connected to Alignment point (G) on tuner), it is recommended that a single pole-double throw switch be mounted as closely as possible to the oscilloscope vertical input terminals so the vertical input terminals may be easily switched between the IF and RF detector circuits.
All connecting leads should be shielded and kept as short as possible.
Set the fine tuning control so the plates are approximately half-meshed

VHF TUNER OSCILLATOR ALIGNMENT

Since channels 2 to 5 and 7 to 12 are aligned by expanding or compressing coil increments, the preceeding aligned increments must not be disturbed.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC (RF marker) 45.75MC (IF marker)	13	Vert. Amp. thru detector (Fig. 5) to IF marker generator and point (E). Low side to chassis.	A17	Adjust so that RF and IF markers coincide as in Fig. 6.
17.	"	"	207MC (10MC Swp)	205.25MC 45.75MC	12	"	A18	Expand or compress coil until markers coincide as in Fig. 6. Curves may not be symmetrical until RF alignment is complete.
18.	"	"	201MC (10MC Swp)	199.25MC 45.75MC	11	"	A19	"
19.	"	"	195MC (10MC Swp)	193.25MC 45.75MC	10	"	A20	"
20.	"	"	189MC (10MC Swp)	187.25MC 45.75MC	9	"	A21	"
21.	"	"	183MC (10MC Swp)	181.25MC 45.75MC	8	"	A22	"
22.	"	"	177MC (10MC Swp)	175.25MC 45.75MC	7	"	A23	"
23.	"	"	85MC (10MC Swp)	83.25MC 45.75MC	6	"	A24	Adjust so that RF and IF markers coincide as in Fig. 6.
24.	"	"	79MC (10MC Swp)	77.25MC 45.75MC	5	"	A25	Expand or compress coil until markers coincide as in Fig. 6.
25.	"	"	69MC (10MC Swp)	67.25MC 45.75MC	4	"	A26	"
26.	"	"	63MC (10MC Swp)	61.25MC 45.75MC	3	"	A27	"
27.	"	"	57MC (10MC Swp)	55.25MC 45.75MC	2	"	A28	"

VHF TUNER RF ALIGNMENT

Care must be exercised not to disturb the preceeding aligned coil increments

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
28.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru detector (Fig. 5) to IF marker generator and point (E). Low side to chassis.	A29, A30 A31	Adjust A29 for maximum mid-band height regardless of skirts. Adjust A30 for flat-topped response. Adjust A30 for proper skirt contour. See Fig. 7. Picture carrier must be 100%. Sound carrier maybe as low as 70%.
29.	"	"	"	45.75MC 42.1MC	"	Vert. Amp. thru detector (Fig. 4) to pin 5 of V3. Low side to chassis.	A9, A10	Adjust for response curve similar to Fig. 8.
30.	"	"	"	211.25MC 215.75MC	"	Vert. Amp. thru detector (Fig. 5) to IF marker generator and point (E). Low side to chassis.		If necessary, SLIGHTLY retouch A30 for flat-top. There must not be more than 9% dip in response curve. See Fig. 8.
31.	"	"	207MC (10MC Swp)	205.25MC 209.75MC	12	"	A32, A33 A34	Compress or expand coils for channel 12 to obtain response curve similar to Fig.10. A32 adjusts mid-band amplitude, A33 adjusts skirt frequency A34 adjusts for flat-top response.
32.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A35, A36 A37	Compress or expand coil for curve similar to Fig. 10. Picture and sound markers must remain on top of curve.
33.	"	"	195MC (10MC Swp)	193.25MC 197.75MC	10	"	A38, A39 A40	"
34.	"	"	189MC (10MC Swp)	187.25MC 191.75MC	9	"	A41, A42 A42	"
35.	"	"	183MC (10MC Swp)	181.25MC 185.75MC	8	"	A44, A45 A46	"
36.	"	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A47, A48 A49	"
37.	"	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A50, A51 A52	"
38.	"	"	79MC (10MC Swp)	77.25MC 81.75MC	5	"	A53, A54 A55	"

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
39.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead	69MC	67.25MC 71.75MC	4	Vert. Amp. thru detector (Fig.5) to IF marker generator and point (E). Low side to chassis.	A56, A57 A58	Compress or expand coils for curve similar to Fig. 10. Picture and sound markers must remain on top of curve.
40.	"	"	63MC (10MC Swp)	61.25MC 65.75MC	3	"	A59, A60 A61	"
41.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	2	"	A62, A63 A64	"

42. Recheck all channel for flat-topped response. If necessary, retouch A30 through A64 in order given. A dip of 30% is permissable for all channels. If the band width of any channel is insufficient after foregoing adjustments, adjust "gimmicks" A65 and A66 by bending wires toward or away from C20 and C18. Remove 330Ω resistor from plate of V3 to B+. Restore connection to L16. Replace V4 in its socket. Remove test equipment.

UHF TUNER ALIGNMENT

Switch the VHF tuner to the UHF position.
Remove the UHF mixer tube (6AN4) from its socket.
Disconnect L16 from the plate of V5, and connect a 330Ω resistor from the plate of V5 to B+.
Connect the detector (Fig. 4) input to pin 5 of V3 and the output of the oscilloscope.

UHF TUNER OUTPUT CIRCUIT ALIGNMENT

Loosely couple the marker generator to the sweep generator lead near the R-C network (Fig. 11)

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
43.	1200Ω in series with .05MFD	High side thru R-C network (Fig.11) to pin 1 or 7 of 6AN4 socket. (Do not insert wire more than 1/4" in socket). Low side to chassis.	43.25MC (10MC Swp)	42.1MC 45.75MC	UHF	Vert. Amp. to output of detector (Fig.4). Low side to chassis.	A67, A68	Adjust for response curve similar to Fig.8. A67 adjust 45.75MC marker while A68 adjust 42.1MC.

ALTERNATE UHF TUNER OUTPUT CIRCUIT ALIGNMENT

43. Tune in a UHF stations test pattern and adjust A67 and A68 for best resolution of vertical wedge.

UHF TUNER OSCILLATOR ALIGNMENT

Remove the UHF tuner cover.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
44.	Direct	Across antenna terminals	900MC (Unmod.)	UHF tuner variable cap. plates fully open	DC probe to point (A). Common to chassis.	A69	Adjust for maximum deflection.
45.	"	"	470MC (Unmod.)	470MC	"	A70	Check coverage. If necessary adjust A70 (capacitor plates) for maximum deflection.

UHF TUNER PRE-SELECTOR ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
46.	Fig. 12	High side thru matching pad. Low side to chassis.	900MC (10MC Swp)	42.1MC 45.75MC (Feed markers to pin 2 (cathode) of V3 (6CB6)	UHF Tuner Cap. plates fully open	Vert. Amp. thru detector (Fig.4) to pin 2 (cathode) of V3 (6CB6). Low side to chassis.	A71 A72	Adjust in order given for response curve similar to Fig.13.

47. Tune sweep generator and tuner simultaneously across entire UHF band. Response curves should be similar to Fig. 13. To obtain best over all response curve adjust variable capacitor segments A73 and A74. Dip or tilt should exceed 30% for any channel. Remove 330Ω resistor from plate of V3 to B+. Restore connection to L16. Remove test equipment.

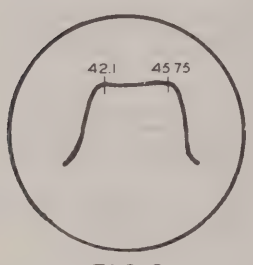


FIG. 8

ACCEPTABLE RESPONSE CURVES

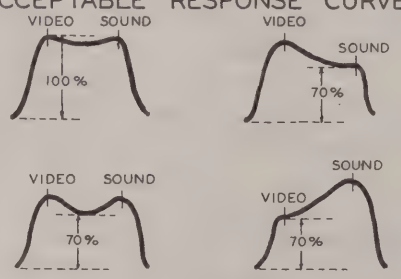


FIG.10

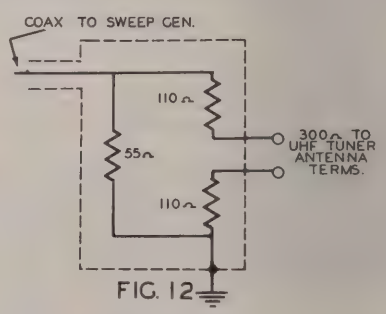


FIG. 12

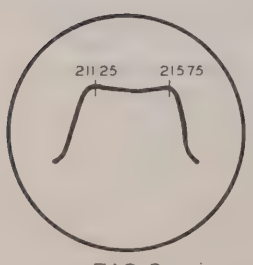


FIG.9

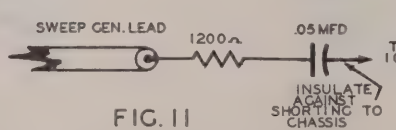


FIG. 11

ACCEPTABLE UHF RESPONSE CURVES

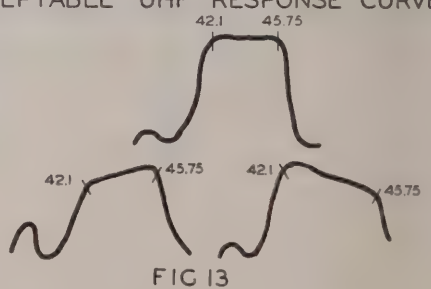
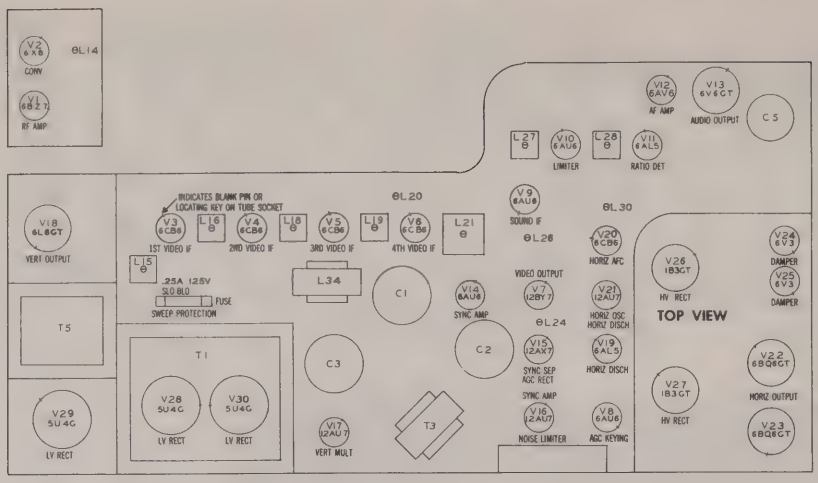


FIG 13

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V28, V29, V30

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V31
Has pic, no sound - V9, V10, V11, V12, V13
Overloaded picture - V8, V12

SYNC FAILURE
No vert. sync - V14, V16, V17, V18
No horiz. sync - V14, V16, V19, V20, V21
No vert. or horiz. sync - V14, V15, V16

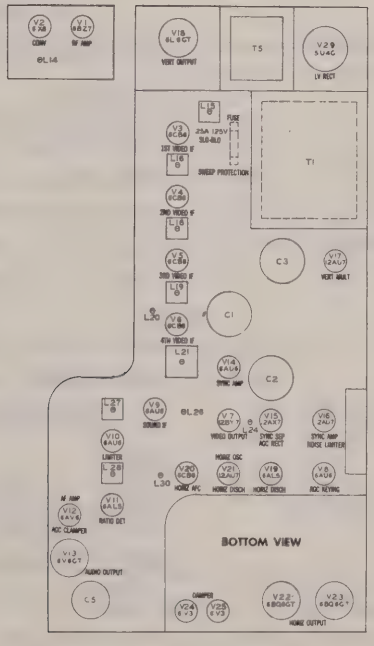
SWEEP FAILURE
No raster, has sound - V21, V22, V23, V24, V25, V26, V27, V31, fuse (M1)
No vertical deflection - V17, V18
Poor vert. linearity or foldover - V17, V18
Poor horiz. linearity or foldover - V21, V22, V23, V24, V25
Narrow picture - V21, V22, V23, V24, V25, V26, V27, V28, V29, V30
Vert. off freq. - V14, V16, V17, V18
Horiz. off freq. - V14, V16, V19, V20, V21

RESISTANCE MEASUREMENTS

PROPERTY OF

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BZ7	‡4.3KΩ	450KΩ	INF	.1Ω	0Ω	INF	220KΩ	0Ω	0Ω
V 2	6X8	0Ω	17KΩ	†4.7KΩ	0Ω	.1Ω	2.2KΩ	220KΩ	†2.2KΩ	†1KΩ
V 3	6CB6	21KΩ	47Ω	0Ω	.1Ω	†1KΩ	†6.8KΩ	0Ω		
V 4	6CB6	19KΩ	47Ω	.1Ω	0Ω	†1KΩ	† 6.8KΩ	0Ω		
V 5	6CB6	19KΩ	47Ω	0Ω	.1Ω	†1KΩ	†6.8KΩ	0Ω		
V 6	6CB6	.1Ω	330Ω	.1Ω	0Ω	†1KΩ	†1KΩ	0Ω		
V 7	12BY7	210Ω	470KΩ	210Ω	.1Ω	.1Ω	0Ω	‡5.3KΩ	†57Ω	210Ω
V 8	6AU6	1.3Meg	4.7KΩ	.1Ω	0Ω	175KΩ	‡35KΩ	4.7KΩ		
V 9	6AU6	47KΩ	0Ω	0Ω	.1Ω	†1KΩ	†1KΩ	100Ω		
V 10	6AU6	47KΩ	0Ω	.1Ω	0Ω	†22KΩ	†22KΩ	0Ω		
V 11	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	68KΩ		
V 12	6AV6	15Meg	0Ω	0Ω	.1Ω	175KΩ	0Ω	‡220KΩ		
V 13	6V6GT	0Ω	0Ω	‡2.5KΩ	‡2KΩ	470KΩ	‡2.5KΩ	.1Ω	390Ω	
V 14	6AU6	1.5KΩ	0Ω	.1Ω	0Ω	†10KΩ	†57Ω	39Ω		
V 15	12AX7	‡35KΩ	†10KΩ	1Meg	.1Ω	.1Ω	†12KΩ	680KΩ	0Ω	0Ω
V 16	12AU7	‡11KΩ	‡680KΩ	330Ω	.1Ω	.1Ω	‡220KΩ	‡220KΩ	100KΩ	0Ω
V 17	12AU7	♦780KΩ	1.2Meg	0Ω	0Ω	0Ω	‡3.4KΩ	1.2Meg	0Ω	.1Ω
V 18	6L6GT	1.8KΩ	.1Ω	‡800Ω	‡40Ω	1.2Meg	1.8KΩ	0Ω	1.8KΩ	
V 19	6AL5	0Ω	1.1Meg	.1Ω	1.8Ω	200KΩ	0Ω	1.1Meg		
V 20	6CB6	680KΩ	330Ω	0Ω	.1Ω	†100Ω	†15KΩ	330Ω		
V 21	12AU7	‡2KΩ	470KΩ	10Ω	0Ω	0Ω	‡180KΩ	150KΩ	0Ω	.1Ω
V 22	6BQ6GT	‡7.5KΩ	.1Ω	470KΩ	‡7.6KΩ	470KΩ	‡7.5KΩ	0Ω	55Ω	TOP CAP ♦0Ω
V 23	6BQ6GT	INF	0Ω	‡180KΩ	‡7.6KΩ	470KΩ	INF	.1Ω	55Ω	TOP CAP ♦0Ω
V 24	6V3	INF	‡40Ω	INF	0Ω	.1Ω	INF	‡40Ω	INF	Pin 9 ‡40Ω / TOP CAP 160KΩ
V 25	6V3	INF	‡ 40Ω	INF	.1Ω	0Ω	INF	‡40Ω	‡40Ω	‡40Ω / TOP CAP 160KΩ
V 26	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP INF
V 27	1B3GT		PINS	1 - 8	HAVE	INF	RESISTANCE			TOP CAP ♦159Ω
V 28	5U4G	♦ 90KΩ	9.4KΩ	INF	2.8Ω	INF	2.8Ω	INF	9.4KΩ	
V 29	5U4G	INF	40KΩ	INF	10Ω	INF	10Ω	INF	40KΩ	
V 30	5U4G	INF	40KΩ	INF	11Ω	INF	11Ω	INF	40KΩ	
V31	27GP4	0Ω	510KΩ	PIN 10 ♦300KΩ	PIN 11 †340KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V28.
‡ MEASURED FROM PIN 8 OF V30
♦ MEASURED FROM TOP CAP OF V24 and V25



TUBE PLACEMENT CHART

TROUBLE SHOOTING AIDS

CAUTION

When back cover is removed from set the high voltage is shorted by a spring loaded lever. This should not be left shorted over prolonged periods of receiver operation as damage may result to high voltage components.

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V21, V22, V23, V24, V25, V29 and V30. Check adjustment of horizontal drive control, position of horizontal size switch and adjustment of B4. Check waveform W19.

If Satisfactory	If Unsatisfactory
Check C115, C116, C113, C114, C6, C119, R130, R131, T4, T6A and other associated components.	Check C109, C110, C111, C108, R121, R122, R123, R125 and other associated components.

DRIVE LINES

Check by substitution V21, V22, V23, V24 and V25. Check C114, C115, C119, C109, C110, C111 and other associated components including T4 and T6A.

COMPRESSED LEFT SIDE

Check by substitution V21, V22, V23, V24 and V25. Check adjustment of horizontal drive control, horizontal size switch and horizontal linearity coil (B4). Check T4, T6A, C113, C114, C6 and other associated circuit components.

FOLDS

Check by substitution V21, V22, V23, V24 and V25. Check T4, T6A, C113, C114, C119 and other components associated with the horizontal output and damper stages.

XMAS TREE EFFECT

Check by substitution V20 and V21. Check L29, L30, C100, C101, C106, C107 and other associated circuit components.

VERTICAL

LOSS OF SWEEP

Check by substitution V17 and V18. Check waveform W12.

If Satisfactory	If Unsatisfactory
Check T5, T6B and other components associated with V18.	Check C93, C94, C97, T3, R98, R99, R102, R103 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V18 and V17. Check adjustment of height and vertical linearity controls. Measure boost B+ voltage.

If Satisfactory	If Unsatisfactory
Check components associated with V17 and V18.	Check boost B+ filter network. Check V24, V25, V22 and V23 by substitution.

COMPRESSED AT BOTTOM

Check by substitution V17 and V18. Check T5, T6B and other associated circuit components.

COMPRESSED AT TOP

Check by substitution V17 and V18. Check C3C, C4 and other associated circuit components.

FOLDS

Check by substitution V17 and V18. Check T5, T6B, C3C, C4 and other associated circuit components.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V19, V20 and V21. Check adjustment B1, B2 and B3 using outline in the alignment section.
Check waveform at W16.

If Satisfactory	If Unsatisfactory
Check components associated with V20 and V21.	Check L29 and other components associated with V19.

CRITICAL HOLD

Check by substitution V19, V20 and V21. Proceed as outlined under "Loss of Sync".

HORIZONTAL PULL

Check horizontal sync and sweep stages for 60 cycle modulation. Check for sync distortion.

VERTICAL

LOSS OF SYNC

Check by substitution V17, V16, V15 and V14. Check waveform at W11.

If Satisfactory	If Unsatisfactory
Check components associated with V17 especially C92.	Check components associated with V14, V15 and V16.

CRITICAL HOLD

Check by substitution V14, V15, V16 and V17. Proceed as outlined under "Loss of Sync".

TRIGGERING

Substitute V14, V15, V16 and V17. Check circuit near these stages for filament lead dress.

VIDEO

LOSS OF VIDEO

Substitute V7. Check associated circuit components especially C66, C64, L25, picture tube, etc.

SOUND BARS

Check local oscillator adjustment in RF tuner. Check sound take-off adjustment A11. Check video IF alignment. Check adjustment of (A16) 4.5MC Trap.

NEGATIVE PIX

Check by substitution V7. Check video detector crystal and assembly. Check picture tube. Check components associated with these stages for failure or change of value.

POOR CONTRAST

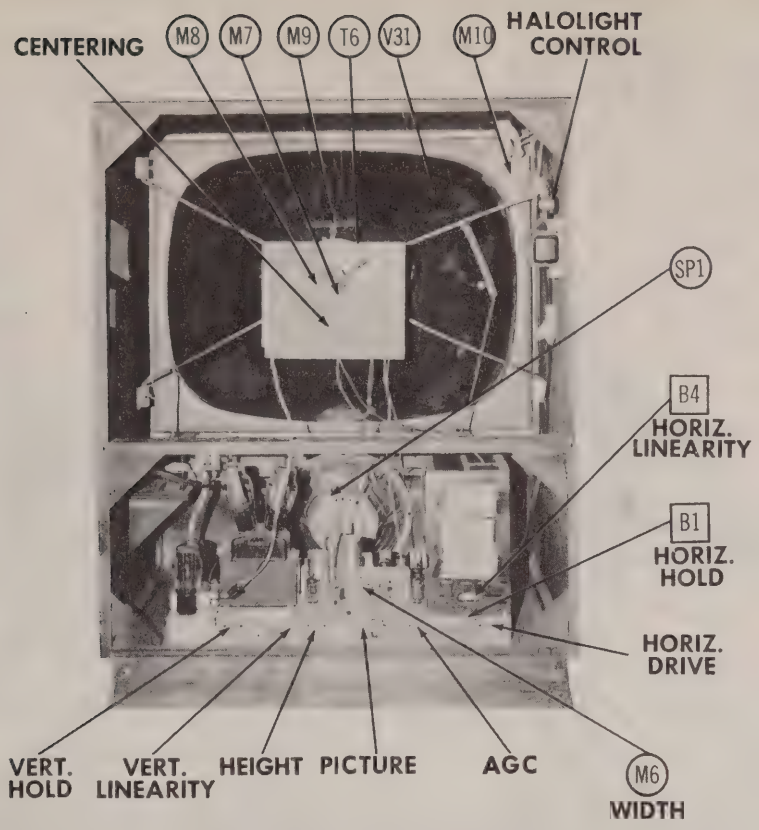
Substitute V7. Check video detector crystal and assembly. Check picture tube and other associated components.

SMEAR

Substitute V7. Check video detector crystal and assembly. Check C64, and C66. Check L25 and L23A. Check R53, R54, R55, R56 and R124 for change of value. Check picture tube and other associated components.

ONE BLACK BAR ACROSS PIX

Check RF tuner, video IF and video amplifier tubes for heater to cathode leakage.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal drive control clockwise as far as possible without crowding the center of the picture or causing a vertical white line to appear.

Set the horizontal size switch for a picture slightly wider than necessary to fill the mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

Remove the horizontal discriminator (V19) from its socket.

Turn the horizontal hold adjustment (B1) until the picture moves back and forth across the screen with blanking bar vertical.

Replace V19 in its socket.

If the horizontal sync is unstable perform the phasing adjustment as follows:

1. Turn the core of the ringing coil (B2) fully counter clockwise.
2. Short out the peaking resistor, R123. Repeat adjustment of the horizontal hold control as above.
3. Adjust horizontal phasing slug (B3) until equal blanking is obtained on both sides of the picture. In order to see the blanking it may be necessary to reduce the contrast to minimum and adjust the brightness control. Move the picture to left and to right with the centering lever 4. Repeat adjustment of the horizontal hold as above.
5. Repeat Step 3.
6. Remove the short across R123 and readjust horizontal hold control as above.
7. Adjust B2 until equal blanking is again visible on both edges of the picture.
8. Repeat adjustment of horizontal hold as above.

AGC ADJUSTMENT

Connect a good antenna to the receiver and tune to the strongest TV signal available.

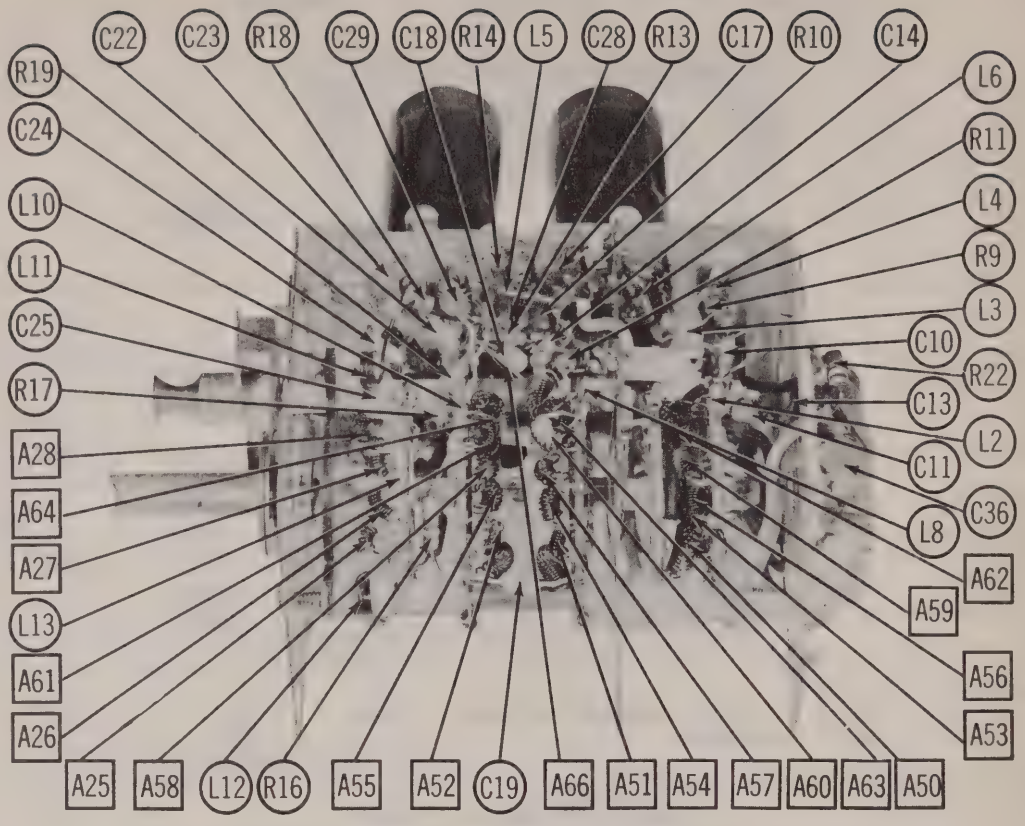
Set the contrast control to approximately 7/8 of maximum position.

Turn the AGC control clockwise until picture "blacks out".

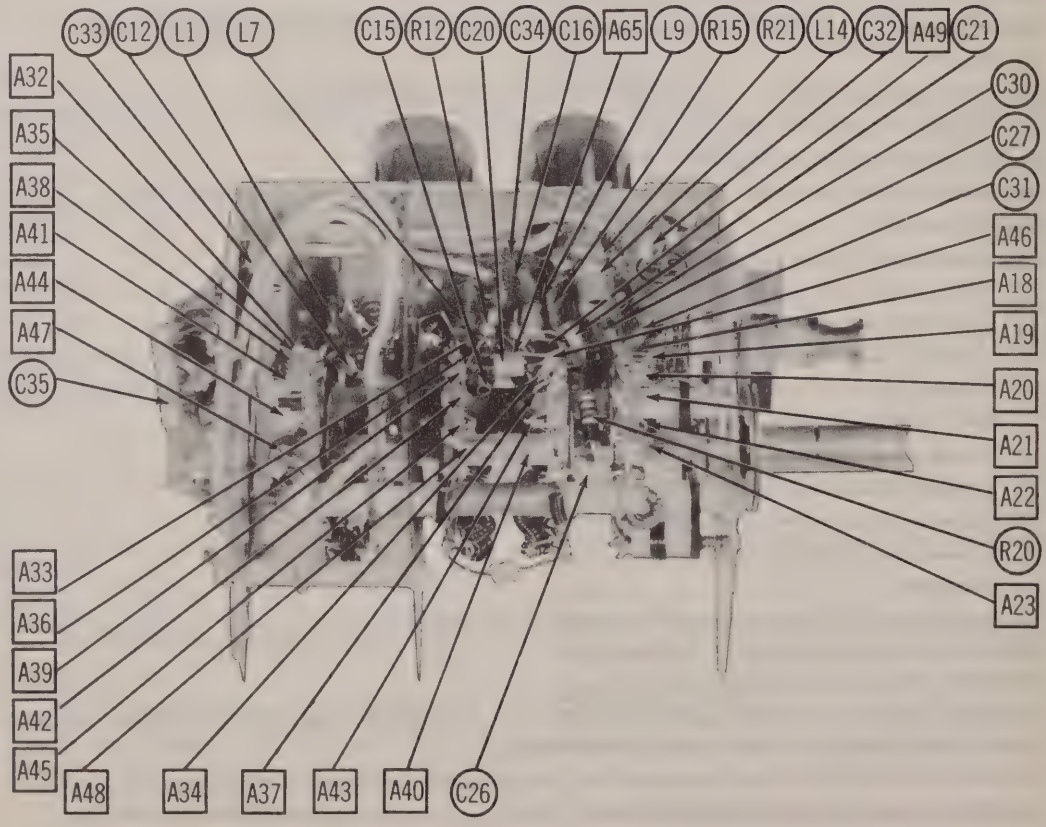
Turn the AGC control counter clockwise until the picture reappears and is stable as the fine tuning control is rocked through the picture.

If picture shows too much contrast, reduce it with the contrast control.

Turn volume control to normal level and check for intercarrier buzz as fine tuning is rocked about the correct tuning point. If present, only a slight retouching of the AGC control should eliminate it. If more than a slight retouching of the AGC control is necessary the alignment of the sound section should be checked.



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		SYLVANIA PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BZ7	6BZ7	9AJ	
V2	Converter	6X8	6X8	9AK	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	4th. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Output	12BY7	12BY7	9BF	
V8	AGC Keying	6AU6	6AU6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Limiter	6AU6	6AU6	7BK	
V11	Ratio Detector	6AL5	6AL5	6BT	
V12	AF Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V13	Audio Output	6V6G	6V6GT	7S	
V14	Sync Amplifier	6AU6	6AU6	7BK	
V15	Sync Sep. -AGC Rect. -Sync Sep.	12AX7	12AX7	9A	
V16	Sync Amplifier Noise Inverter	12AU7	12AU7	9A	
V17	Vert. Oscillator-Vert. Discharge	12AU7	12AU7	9A	
V18	Vert. Output	6L6G	6L6G	7S	
V19	Horiz. Discr.	6AL5	6AL5	6BT	
V20	Horiz. AFC	6CB6	6CB6	7CM	
V21	Horiz. Oscillator-Horiz. Discharge	12AU7	12AU7	9A	
V22	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V23	Horiz. Output	6BQ6GT	6BQ6GT	6AM	
V24	Damper	6V3	6V3	9BD	
V25	Damper	6V3	6V3	9BD	
V26	HV Rectifier	1B3GT	1B3GT	3C	
V27	HV Rectifier	1B3GT	1B3GT	3C	
V28	LV Rectifier	5U4G	5U4G	5T	
V29	LV Rectifier	5U4G	5U4G	5T	
V30	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA			RTMA BASE TYPE	NOTES
	SYLVANIA PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.		
V31	27GP4	27GP4	27EP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲40	400	161-2004	AFH2-64		CO35		FP377	TVL-2675	
B	▲80	400								
C2A	▲40	400	161-2004	AFH2-64		CO35		FP377	TVL-2675	
B	▲80	400								
C3A	■40	200	161-3012	AFH4-120		D101		FP453	TVL-4700	
B	▲80	200								
C	▲100	50								
C4	10	500	161-1010	PRS500/10		BR1250		TC82	TVA-1955	
C5A	▲20	400	161-4007	AFH4-57		DO52		FP444	TVL-4667	
B	■10	400								
C	25	25								
D	▲20	200								
C6	10	350	161-1012	PRS350/10		BR1235A		TC62	TVA-1604	
C7	2	50	161-1001	PRS150/4		BBR2-50T		TC302	TVA-1301	
C8	2	50	161-1001	PRS150/4		BBR2-50T		TC302	TVA-1301	
C9	2	50	161-1001	PRS150/4		BBR2-50T		TC302	TVA-1301	
C10	15			SI15	D6-150		GP1K-150	UC-5415	5GA-Q15	
C11	22			SI22NP0	TCZ-22		NP0K-220	ZT-5422	5TCC-Q22	
C12	3			SI3NP0	TCZ-3		NP0K-030		5TCCB-V3	
C13	800			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C14	470									
C15	470			SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C16	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	800			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C18	.3									
C19	1.6									
C20	.36									
C21	15									
C22	.75									
C23	1.5									
C24	10									
C25	1.5			SI1.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C26	1.6									
C27	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C29	800			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C30	800			BPD-0008	DD-801	TM5D1	801-001	DC-521	5HK-D1	
C31	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C32	75			SI75N080						
C33	7.5									
C34	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C35	270		166-0270N	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C36	.22	200	160-02022	P488-22		PTE4P22		PT4025	4TM-P22	
C37	1		166-0001P	SI1NP0					5TCCB-V1	
C38	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C39	.22	200	160-02022	P488-22		PTE4P22		PT4025	4TM-P22	
C40	.047	200	160-02147	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C41	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C42	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	RATING CAP.	RATING VOLT	SYLVANIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C43	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C44	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C45	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C46	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C47	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C48	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C49	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C50	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C51	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C52	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C53	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C54	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C55	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C56	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C57	270		166-0270N	SI270	D6-271		GP2K-271	UC-5337	5GA-T27	
C58	1000		166-1000D	BPD-001	DD-102	TM3D1	801-001	DC-521	5HK-D1	
C59	43		166-0043P				NP0K-430			
C60	4.7		166-0068N	SI4.7NP0	TCZ-4.7		NP0K-4R7	Z7-555	5TCCB-V47	
C61	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C62	10		166-0010P	SI10NP0	TCZ-10		NP0K-100	Z7-541	5TCC-Q1	
C63	10		166-0010P	SI10NP0	TCZ-10		NP0K-100	Z7-541	5TCC-Q1	
C64	.1	400	162-0201	P468-1	DF-104	PT4P1		PT401	4TM-P1	
C65	4.7		166-0068N	SI4.7NP0	TCZ-4.7		NP0K-4R7	Z7-555	5TCCB-V47	
C66	.22	200	160-0222	P468-22		PT4P22		PT4025	4TM-P22	
C67	.22	200	160-0222	P468-22		PT4P22		PT4025	4TM-P22	
C68	4.7		166-0068N	SI4.7NP0	TCZ-4.7		NP0K-4R7	Z7-555	5TCCB-V47	
C69	4.7		166-0068N	SI4.7NP0	TCZ-4.7		NP0K-4R7	Z7-555	5TCCB-V47	
C70	10		166-0010P	SI10NP0	TCZ-10		NP0K-100	Z7-541	5TCC-Q1	
C71	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C72	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C73	47		166-0047M	SI47	D6-470		GP2K-470	UC-5447	5GA-Q47	
C74	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C75	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D47	
C76	.02		166-4703D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C77	330		166-0330	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C78	680	500	163-0680	1479-0007		SR5T7		MS-37	5GA-T33	
C79	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C80	.01		†190-0006	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C81	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C82	100	500	163-0100	1468-0001	D8-101	SW5T1	GP1K-101	MC235	1FM-31	
C83	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C84	.0047	600	160-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C85	.0033	600	160-06233	P688-0033	D6-332	PT6ED33	GP2-333-332	PT6233	6TM-D33	
C86	.0047	400	163-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C87	.47	200	160-06047	P288-47		PT2S5		PT405	2TM-P47	
C88	.047	400	160-06147	P488-047	DF-503	PT4S47		PT4147	4TM-S47	
C89	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C90	.002			P688-002		PT6E2		PT602		
B	.005		●190-0007	P688-005	●PC-100	PT6ED5	●1405-01	PT625	●101C1	
C	.006			P688-005		PT6ED5		PT625		
C91	.0033	600	160-06233	P688-0033	D6-332	PT6ED33	GP2-333-332	PT6233	6TM-D33	
C92	.0047	400	163-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C93	.047	400	162-06147	P488-047		PT4S47		PT4147	4TM-S47	
C94	.1	400	160-0401	P488-1	DF-104	PT4P1		PT401	4TM-P1	
C95	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C96	4700		166-4700D	BPD-0047	MD-502	TM5D5	811-005	DC-525	5HK-D5	
C97	.1	400	160-0401	P488-1	DF-104	PT4P1		PT401	4TM-P1	
C98	330		166-0330	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C99	100	500	163-0100	1468-0001	D8-101	SW5T1	GP1K-101	MC235	1FM-31	
C100	.0047	400	163-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C101	.015	400	160-0610	P488-015		PT6S15		PT615	6TM-S15	
C102	.22	400	160-06022	P488-22		PT4P22		PT4025	4TM-P22	
C103	.22	200	160-06022	P488-22		PT4P22		PT4025	4TM-P22	
C104	.1	200	162-0201	P288-1	DF-104	PT2P1		PT401	2TM-P1	
C105	.0047	400	162-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C106	.001	500	163-0100	1468-0001	D8-101	SW5T1	GP1K-101	MC235	1FM-31	
C107	.0022	400	160-06222	P688-0022	D6-222	PT6ED22	GP2-333-222	PT6222	6TM-D22	
C108	.01	600	160-0611	P688-01	D8-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C109	4700		166-7400D	BPD-0041	MD-502	TM5D1	811-005	DC-525	5HK-D47	
C110	680	500	163-0680	1479-0007		SR5T7		MS-37	5GA-T33	
C111	1000		166-1000P	SI1000	D8-103	TM6D1	GP2L-102	UC-521	5HK-D1	
C112	.1	500	160-0801	P888-1	DF-104	PT8EP1		PT801	8TM-P1	
C113	.1	600	162-0601	P688-1		PT6EP1		PT601	6TM-P1	
C114	.033	600	162-06133	P688-033						
C115	.0047	600	160-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C116	.01	600	160-0611	P688-01	D6-103	PT6S81	GP2-333-103	PT611	6TM-S1	
C117	.0047	600	160-06247	P688-0047	D6-472	PT6ED47	GP2-333-472	PT6247	6TM-D47	
C118	1000		166-1000D	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C119	.22	200	160-06022	P488-22		PT4P22		PT4025	4TM-P22	
C120	500	20000	169-0015	HV20C	TV3-502	MM-C20T5	413-501	HV30035A	20DK-T5	
C121	500	20000	169-0015	HV20C	TV3-502	MM-C20T5	413-501	HV30035A	20DK-T5	
C122	500	30000	169-0016							
C123	82	2000							20GA-Q82	Note 1

† Items C80 and R75 are combined in one unit.
● Items C90A, C90B, C90C, R92A, R92B, R92C are combined in one unit.
Note 1 - Some models use 56MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SYLVANIA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	157-0923	QJ-483 *	RTV-428		UF26L / UR187Z5 †	Brightness-Panel
B	1Meg	½					UF-27	Volume-Tapped ① 150KΩ-rear
C	Switch							Attach to R1B
R2A	250KΩ	½	153-0007	QU-130	AG-55-S	AB-50	SU-46	Horiz. Drive
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	1Meg	½	153-0009	QU-137	AG-61-S	AB-60	SU-54	AGC
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	250Ω	2	153-3007	WK-250	A43-300	VK-123	R250L	Picture-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R4A
R5A	1.5Meg	½	153-0014	QU-138	AG-83-S	AB-75	SU-58	Height
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6	2500Ω	2	153-3013	WK-2500R				Vert. Linearity-Wire Wound
R7A	1.5Meg	½	153-0014	QU-138	AG-83-S	AB-75	SU-58	Vert. Hold
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R7A

CONTROLS (cont)

ITEM No	RATING RESIST-ANCE	RATING WATTS	SYLVANIA PART No	IRC PART No	CLAROSTAT PART No	CENTRALAB PART No	MALLORY PART No	INSTALLATION NOTES
R8A	350KΩ	½	153-0019	QU-133	AG-59-S		U-50	Halo Light
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R8A

† Universal Replacement (Mallory exact duplicate part #UR18555)
* CONCENTRIKIT EQUIVALENT - KIT K-3, BASE ELEMENTS & SHAFTS B11-139 & P1-136 (Panel) B13-137X & R2-216 (Rear), & SWITCH 76-3.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No	IRC PART No	NOTES
R9	470Ω	½		BTB-4700	
R10	1Meg	½			
R11	750KΩ 5%	½			
R12	100KΩ	½		BTB-1000	
R13	220KΩ	½		BTB-220K	
R14	2200Ω	½		BTB-2200	
R15	2200Ω	½		BTB-2200	
R16	3900Ω	½		BTB-3900	
R17	470Ω	½		BTB-470	
R18	15KΩ	½			
R19	220Ω	½		BTB-220	
R20	4700Ω	½		BTB-4700	
R21	1000Ω	½		BTB-1000	
R22	56KΩ	½	181-0563	BTB-56K	
R23	100KΩ	½	181-0104	BTB-100K	
R24	1.5Meg	½	181-0155	BTB-1.5Meg	
R25	56KΩ	½	181-0563	BTB-56K	
R26	3300Ω	5	187-0012		
R27	1000Ω	½	181-0102	BTB-1000	
R28	2200Ω	½	181-0222	BTB-2200	
R29	47Ω	½	181-0470	BTB-47	
R30	5800Ω	½	181-0682		
R31	1000Ω	½	181-0102	BTB-1000	
R32	18KΩ	½	181-0183	BTB-18K	
R33	1000Ω	½	181-0103	BTB-1000	
R34	2700Ω	½	181-0272	BTB-2700	
R35	47Ω	½	181-0470	BTB-47	
R36	5800Ω	½	181-0682		
R37	1000Ω	½	181-0102	BTB-1000	
R38	1000Ω	½	181-0102	BTB-1000	
R39	1500Ω	½	181-0153	BTB-1500	
R40	47Ω	½	181-0470	BTB-47	
R41	6800Ω	½	181-0682		
R42	1000Ω	½	181-0103	BTB-1000	
R43	1500Ω	½	181-0152	BTB-1500	
R44	330Ω	½	181-0331	BTB-330	
R45	1000Ω	½	181-0102	BTB-1000	
R46	1000Ω	½	181-0103	BTB-1000	
R47	10KΩ	½	181-0103		
R48	4700Ω	½	181-0472	BTB-4700	
R49	1800Ω	½	181-0182	BTB-1800	
R50	1500Ω	½	181-0152	BTB-1500	
R51	470KΩ	½	181-0474	BTB-470K	
R52	15KΩ	½	181-0153	BTB-15K	
R53	33000Ω	5	187-0022		
R54	2000Ω	½	187-0005	1 3/4A-2000	Note
R55	4.7Meg	½	181-0475	BTS-4.7Meg	
R56	330KΩ	½	181-0334	BTB-330K	
R57	10KΩ	2	183-0103	BTB-10K	
R58	470KΩ	½	181-0474	BTS-470K	
R59	1Meg	½	181-0105	BTS-1Meg	
R60	330KΩ	½	181-0334	BTS-330K	
R61	4700Ω	2	183-0472	BTB-4700	
R62	33KΩ	½	181-0333	BTS-33K	
R63	470KΩ	½	181-0474	BTS-470K	
R64	270KΩ	2	189-0031	BTB-270K	
R65	270KΩ	2	189-0031	BTB-270K	
R66	68KΩ	2	189-0032	BTB-68K	
R67	47KΩ	½	181-0473		
R68	100Ω	½	181-0101	BTS-100	
R69	1000Ω	½	181-0102	BTS-1000	
R70	47KΩ	½	181-0473		
R71	22KΩ	½	181-0223		
R72	270Ω	½	181-0271	BTS-270	
R73	100KΩ	½	181-0104	BTS-100K	
R74	68KΩ	½	181-0683	BTS-68K	
R75	47KΩ	½	†181-0473	BTS-47K	

ITEM No.	RATING OHMS	RATING WATT	SYLVANIA PART No	IRC PART No	NOTES
R76	15Meg	½	181-0156	BTS-15Meg	
R77	220KΩ	½	181-0224	BTS-220K	
R78	470KΩ	½	181-0474	BTS-470K	
R79	390Ω	1	182-0391	BTA-390	
R80	47Ω	½	181-0470		
R81	2000Ω	5	187-0005		
R82	33KΩ	½	181-0333	BTS-33K	
R83	680KΩ	½	181-0684	BTS-680K	
R84	10KΩ	½	181-0103	BTS-10K	
R85	12KΩ	½	181-0123	BTS-12K	
R86	10KΩ	½	181-0103	BTS-10K	
R87	100KΩ	½	181-0104	BTS-100K	
R88	220KΩ 5%	1	182-02245	BTA-220K 5%	
R89	680KΩ	½	181-0684	BTS-680K	
R90	330Ω	½	181-0331	BTS-330	
R91	15KΩ	2	183-0153	BTB-15K	
R92	33KΩ	1	182-0333	BTA-33K	
R92A	22KΩ	½		BTS-22K	
B	8200Ω	½	●187-0007	BTS-8200	
C	6200Ω	½		BTS-8200	
R94	68KΩ	½	181-0683	BTS-68K	
R95	680KΩ	½	181-0684	BTS-680K	
R96	3300Ω	½	181-0332	BTS-3300	
R97	33KΩ	½	181-0333	BTS-33K	
R98	680KΩ	½	181-0684	BTS-680K	
R99	100KΩ	½	181-0104	BTS-100K	
R100	22000Ω 5%	½	181-02225	BTS-2200-5%	
R101	22000Ω 5%	½	181-02225	BTS-2200-5%	
R102	*	*	189-0030		
R103	680KΩ	½	181-0684	BTS-680K	
R104	470KΩ	½	181-0474	BTS-470K	
R105	680Ω	2	183-0681	BTB-680	
R106	560Ω	½	181-0561	BTS-560	
R107	560Ω	½	181-0561	BTS-560	
R108	1000Ω	½	181-0102	BTS-1000	
R109	100KΩ	½	181-0104	BTS-100K	
R110	100KΩ	½	181-0104	BTS-100K	
R111	1Meg	½	181-0105	BTS-1Meg	
R112	4.5Ω	½	189-0007		
R113	470KΩ	½	181-0474	BTS-470K	
R114	330Ω	½	181-0331	BTS-330	
R115	1000Ω	½	181-0102	BTS-1000	
R116	8200Ω	½	181-0822	BTS-8200	
R117	15KΩ	1	182-0153	BTA-15K	
R118	33KΩ	2	183-0333	BTB-33K	
R119	470KΩ	½	181-0474	BTS-470K	
R120	22KΩ	½	181-0223	BTS-22K	
R121	150KΩ	½	181-0154	BTS-150K	
R122	82KΩ	½	181-0823	BTS-82K	
R123	4700Ω	1	181-0472	BTS-4700	
R124	10Ω	½	182-0100		
R125	470KΩ	½	181-0474	BTS-470K	
R126	10Ω	½	181-0101		
R127	100Ω	½	181-0101		
R128	100Ω	½	181-0101		
R129	10Ω	½	181-0101		
R130	15KΩ	2	183-0153	BTB-15K	
R131	15KΩ	2	183-0153	BTB-15K	
R132	1000Ω	5	187-0014	1 3/4A-1000	
R133	4.3Ω	½	189-0007		
R134	4.3Ω	½	189-0007		
R135	1Meg	½			
R136	1Meg	2			
R137	1Meg	2			
R138	4700Ω	2	183-0472	BTB-4700	
R139	2000Ω	5	187-0005	1 3/4A-2000	
R140	39Ω	½	181-0390	BTS-39	
R141	220KΩ	½	181-0224	BTS-220K	

Note: Some Models may use a 220Ω (2 watt) resistor in this application.
* Ceramic voltage sensitive.
† Items R75 and C90 are combined in one unit.
‡ Items R92A, R92B, R92C, C90A, C90B, C90C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117 VAC ① 2.86 A.	620 VCT ② .200ADC tap ⑥ 300 VCT .115 ADC	5VAC ③ 6 A.	5VAC ④ 3 A. SEC. 4 6.3VAC ⑤ 13.6 A.	141-0026					

TRANSFORMER HaloLight

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T2	117 VAC ① .1 A.	1600 VDC			141-0027					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI	RATING DC RESISTANCE SEC	SYLVANIA PART No.	STANCOR PART No	MERIT PART No.	CHICAGO PART No	TRIAD PART No	RCA TYPE No.	NOTES
T3	130Ω	750Ω	242-0002	A-8125	A-3003	TBO-5	A-97X		Vert. Osc. Trans.
T4	154.2Ω tap ④ 4.2Ω	6.2Ω SEC. 2 .85Ω SEC. 3 0Ω SEC. 4 0Ω	241-0010				D-28③②		Horiz. Output Trans.
T5	750Ω	7.5Ω	241-0009	A-8113	A-3038	TSO-5	A-99X		Vert. Output Trans.
T5A	20Ω		100-0011	IRC					Horiz. Deflection Coils
B	56Ω								Vert. Deflection Coils
T7	3.3Ω tap ⑨ 1.5Ω		133-0003			TL-3			Horiz. Linearity Coil

① Drill new mounting holes.
② Connect 6BQ6 plates to terminal #7, remove wire from center tap (yellow dot) on linearity coil to original #3 on transformer, then connect original #2 to new #5, original #3 to new #6, original #5 to new #4, original #6 to new #3, original #7 to new #1.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	5KΩ	3.5Ω	540Ω	.63Ω	143-0022	A-3877 ①	A-2930 ①	RO-9 ①	S-5X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	SYLVANIA PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.5Ω	538-1005	10J11	10A3i	

COILS (RF-IF)

ITEM No.	USE	DC RES PRI.	DC RES SEC.	SYLVANIA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Trans.	0Ω CT	0Ω					Low Channel Secondary-0Ω
L2	Ant. Coils	0Ω						
L3	UHF Ant.Coil	0Ω						
L4	Ant. Coil	0Ω						Channel 13
L5	Fil.Choke	0Ω						
L6	Neutr.Coil	0Ω						
L7	RF Coil	0Ω						Channel 13
L8	RF Coils	0Ω						
L9	Mixer Grid Coil	0Ω						Channel 13
L10	Mixer Grid Coils	0Ω						
L11	Osc. Plate Coil	0Ω CT						Channel 13 Channel 8
L12	Osc. Coil	0Ω						
L13	Osc. Coils	0Ω						
L14	Conv.Plate	.1Ω						
L15	1st. Video IF	.1Ω		119-0002				Includes trap
L16	2nd.Video IF	.1Ω	.1Ω	119-0003			6232	Includes trap
L17	Fil.Choke	0Ω		147-0014	19-3001	TV-189	6604	.7 Microhenry
L18	3rd.Video IF	.1Ω	.1Ω	119-0004			6233	Includes trap
L19	4th.Video IF	.1Ω	.1Ω	119-0005			6234	
L20	Cathode Trap	0Ω	0Ω	118-0011	20-1045		6210	
L21	5th.Video IF	.1Ω	.1Ω	126-0001				Includes IN105 Crystal Detector
L22	Series Peaking Coil	1.5Ω		118-0010			4612	9.6 Microhenries
L23A	Series Peaking Coil	4.4Ω		131-2008	19-3093	TV-181	6177	95 Microhenries
B	Shunt Peaking Coil	9Ω			19-3300		4565	330 Microhenries, part of L23A
L24	4.5MC Trap	6Ω		130-0001	20-1005	TV-181	1470	
L25	Series Peaking Coil	4.2Ω		131-2011	19-3093	TV-181	6177	95 Microhenries
L26	1st.Sound IF	8Ω		130-0001	17-3400	TV-151	1468	
L27	2nd.Sound IF	2.8Ω	2.8Ω	130-0003	19-3445 *	TV-113	6203	
L28	Ratio Det.	12Ω	1.5ΩCT	128-0006	17-3497	TV-115	6205	Tertiary winding-.85Ω
L29	Horiz.Discr.	40Ω	85ΩCT	128-0009	20-1400 *			Cathode winding-10Ω
L30	Ringing Coil	37Ω		146-0005	19-1575	TV-163	6210	
L31	RF Choke	1.5Ω		118-0010			4612	9.6 Microhenries
L32	RF Choke	1.5Ω		118-0010			4613	9.6 Microhenries

* Drill mounting holes.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE @ CURRENT 1000 ~(Hz)	SYLVANIA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L33	.300ADC	39.5Ω	1.1 Hy.	145-0004	C-2326 ①	C-2996 ①	TR-1325 ①	C-17X ①
L34	.115ADC	57Ω	1.1 Hy.	145-0002	C-2326 ①	C-2996 ①	TR-1733 ①	C-21X ①

① Drill one new mounting hole.

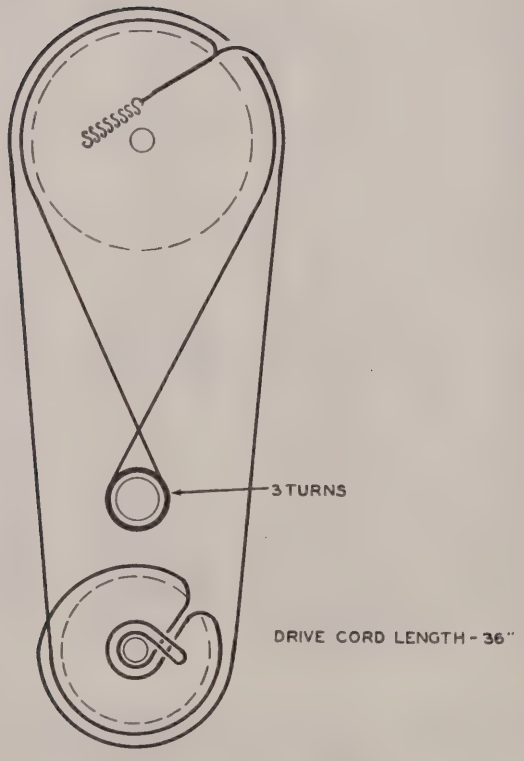
FUSES

ITEM No.	TYPE	RATING	SYLVANIA PART No. FUSE	SYLVANIA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	.25A. 125 V.	181-0016	487-0008	313.250 (3AG 1/4A. Slo-Blo	357001	MDL-1/4	4405

PARTS LIST AND DESCRIPTIONS (Continued)

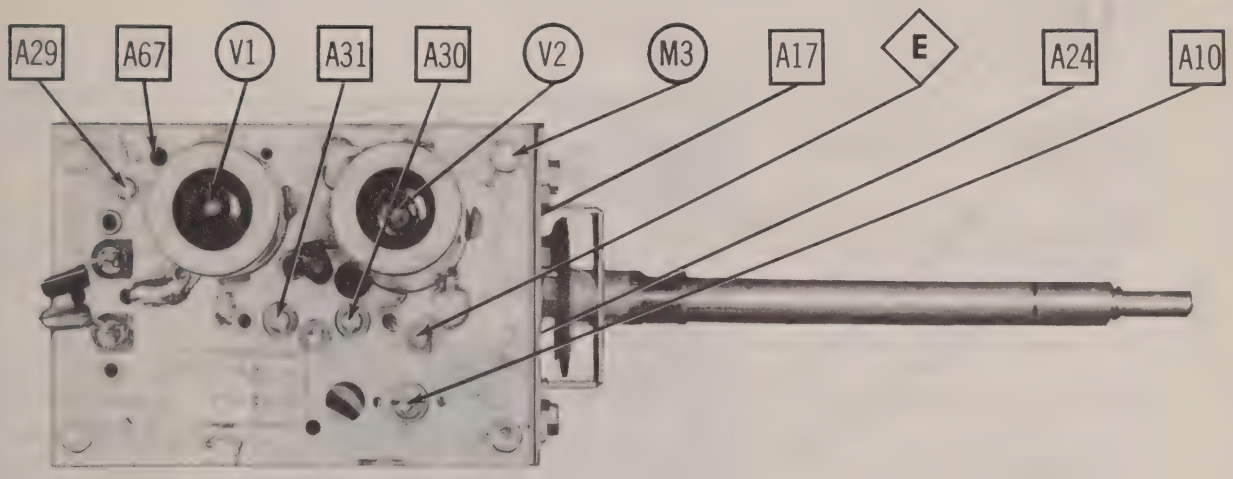
MISCELLANEOUS

ITEM No.	PART NAME	SYLVANIA PART No.	NOTES
M2	Pilot Lamp	611-0047	Channel Indicator (Type # 47)
M3	VHF Tuner	323-0032	Includes Tubes
M4	UHF Tuner	323-0036	Includes Tubes (Used in chassis 1-512-2)
M5	Crystal		1N105 (Video Detector)
M6	Switch	573-005	Horiz. Size
M7	Focus Magnet	400-0018	Includes Centering Device
M8	Ion Trap Magnet	400-0017	
M9	Correction Magnet	400-0019	4 Used
M10	HaloLight Tube	611-2700	
M11	Horiz. Regulator	40B2	
	Knob	744-0023	Brightness
	Knob	744-0021	HaloLight Control
	Knob	740-0029	Fine Tuning
	Knob	744-0022	Volume
	Knob	743-0022	Channel Selector (With dial)
	Dial	722-0028	UHF Dummy (Chassis 1-512-1)
	Dial	722-0027	UHF Dial (Chassis 1-512-2)
	Safety Glass	710-0010	27"
	Back Cover	760-0041	Includes Line Cord and Interlock Assembly

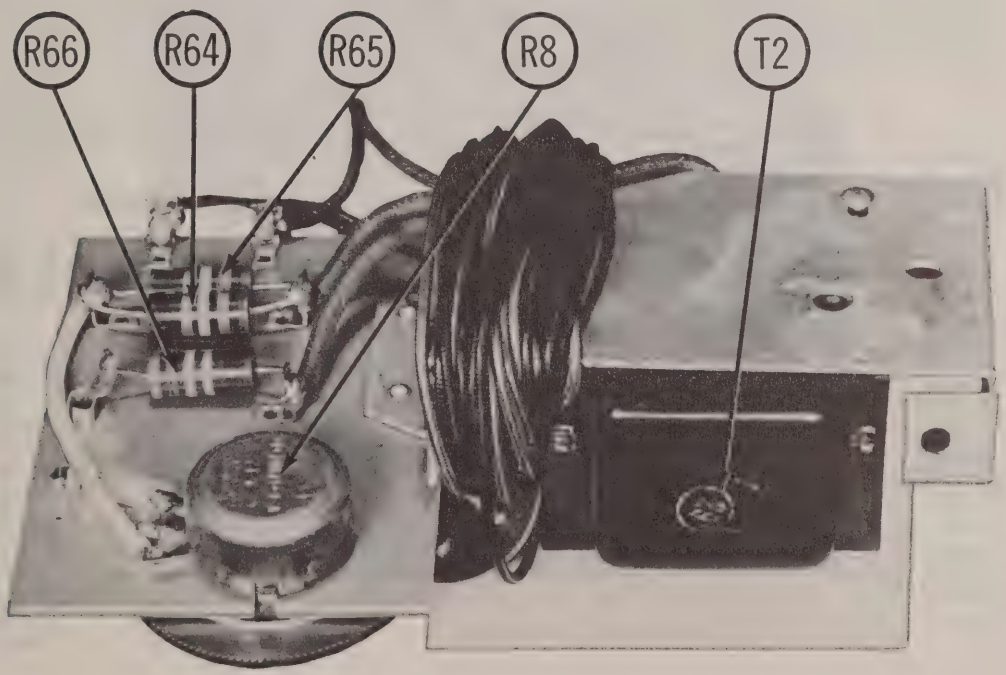


UHF DRIVE CORD STRINGING

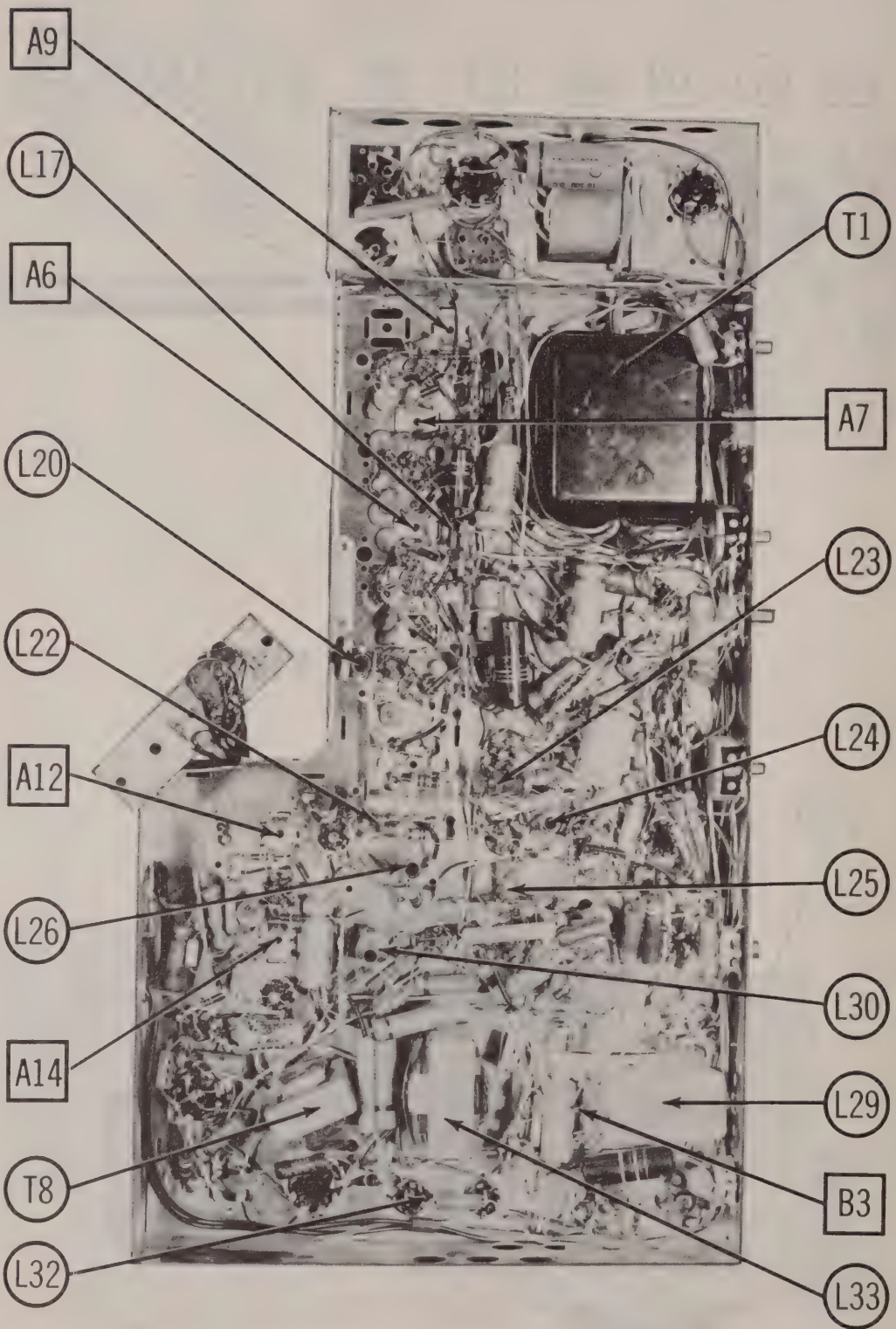
PROPERTY OF
L. F. BL[illegible]CENSHIP
[illegible]



RF TUNER-TOP VIEW



HaloLight CONTROL UNIT



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly, switch on volume control and T1. If filaments light, check V29 and V30. Check components of the B+ filter and decoupling network.

SMALL RASTER and /or DIM PICTURE

Check by substitution V28, V29 and V30. Check B+ filter and decoupling network and components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V21, V22, V23, V24, V25, V26, and V27. Check waveform at W19.

If Satisfactory	If Unsatisfactory
Check R134, R135, R136, R137, R133, C120, C121, C122, C112, C113, C114, T4 and T6A.	Check C109, C110, C111, C108, C107, R122, R125 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V21, V22, V23, V24, V25, V26, V27, V29 and V30. Check picture tube. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V26, V27, V25, V24, V23, V22, V21, V29 and V30. Check R133, R134, R135, R136, R137, C120, C121, C122, C112, T4 and T6A. Check picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5, V6 and video detector assembly. Check other associated circuit components.

NO RASTER NO SOUND NO PIX

See "Dead Set".

TOTAL LOSS OF SYNC

Check by substitution V14, V15 and V16. Check associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

DISASSEMBLY INSTRUCTIONS

MAIN CHASSIS

1. Remove 4 push on type control knobs from front panel.
2. Disconnect built-in antenna. Remove 11 wood screws. Remove rear cover.
3. Disconnect speaker, HaloLight plug, 2 tuner plugs, horizontal and vertical yoke plugs, CRT socket, HV lead (remove screw from HV lead support).
4. Remove 2 wood screws. Remove Off/On /Volume and brightness control bracket.
5. Remove 4 chassis bolts. Remove chassis.

REMOVAL OF TUNER (Separate from Main Chassis)

1. Remove tuner plug from chassis.
2. Remove ground clamp from CRT support rod.
3. Remove 2 wood screws. Remove antenna bracket.
4. Remove channel selector pilot light.from bracket.
5. Remove 3 metal screws. Remove tuner.

SPEAKER

1. Remove 4 speaker nuts.
2. Remove speaker (Not necessary for chassis removal).

HaloLight CONTROL UNIT

1. Remove HaloLight plug from control unit.
2. Remove power plug from chassis.
3. Remove 2 wood screws. Remove HaloLight unit.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the RF tuner oscillator circuit may be accomplished by removing the channel selector and fine tuning knobs.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove picture tube (See Below)

PICTURE TUBE REMOVAL

When removing the picture tube caution should be observed through out the operations. Chassis removal is not necessary to remove picture tube.

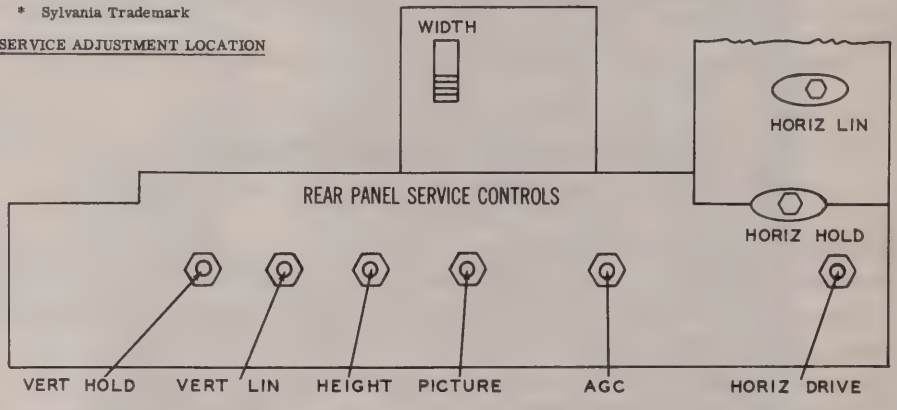
1. Remove 11 wood screws. Remove rear cover.
2. Disconnect speaker, HaloLight plug, 2 tuner plugs, horizontal and vertical yoke plugs, CRT socket and HV lead.
3. Lay cabinet on floor face down.
4. Remove ion trap and focus magnet.
5. Loosen the 4 picture tube fasterners, enough to allow heads to be removed from enlarged openings. Remove the 4 mounting rods.
6. Remove picture tube support and yoke.
7. With one hand grasp the neck of the picture tube as far forward as possible. Tilt the picture tube until other hand can reach under face and lift out.

HaloLight * TUBE REMOVAL

1. Remove picture tube (see picture tube removal instructions).
2. Disconnect HaloLight plug from HaloLight control.
3. Remove staple holding vinylite tubing at top of cabinet.
4. Remove 4 tube mounting brackets. Remove light shield from cabinet.
5. Remove wire clips holding HaloLight tube to shield. Remove HaloLight tube from shield.

* Sylvania Trademark

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the rear panel of the chassis.

Adjust the horizontal hold slug until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L28) located on top of chassis. (See tube placeme nt chart).

FUSES

One fuse is used for horizontal sweep circuit protection. (See tube placement chart, for location).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly . Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION CORRECTION

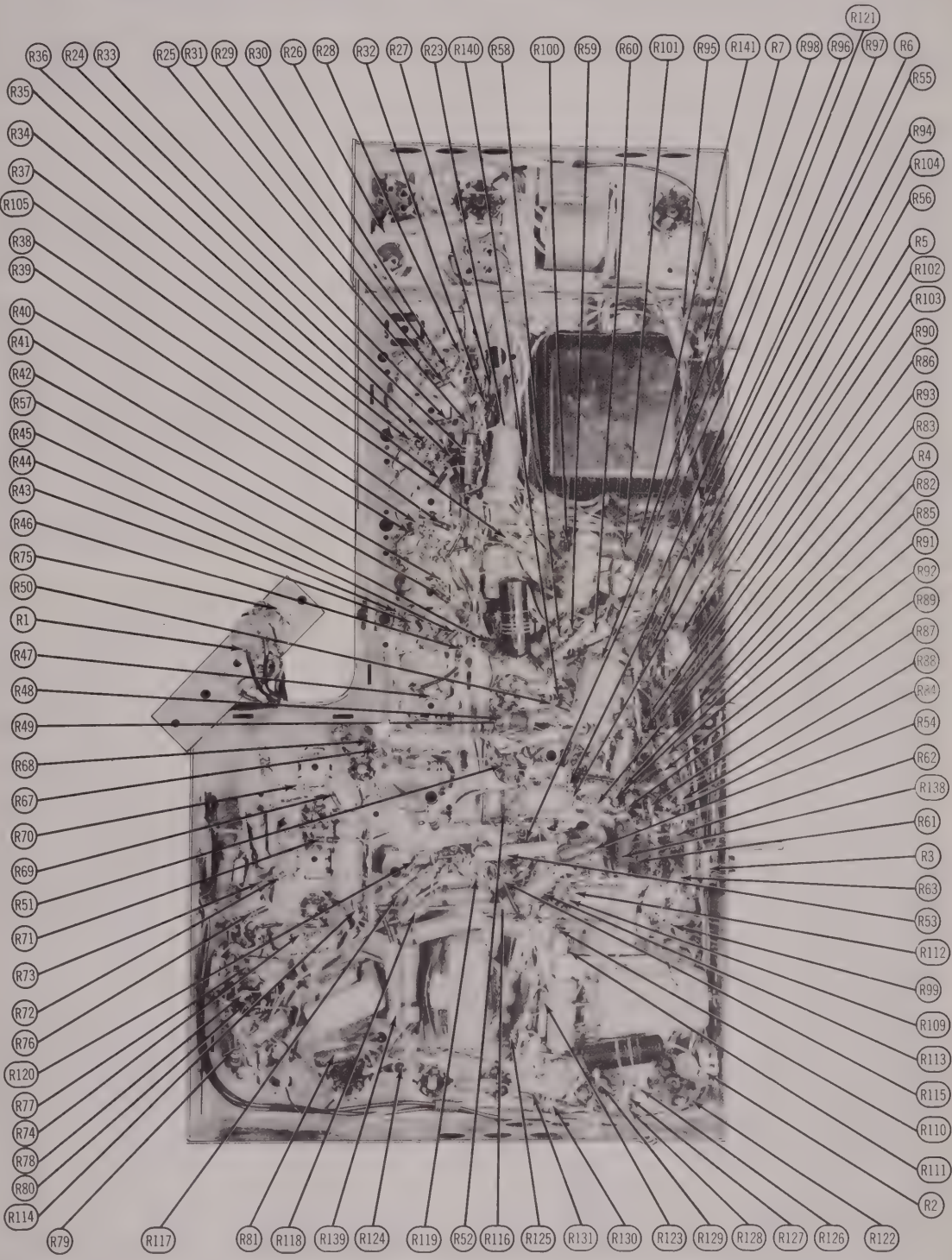
Move raster to either side by means of the centering shaft on the focus magnet, so that one edge of the raster is visible.

If necessary, adjust the corrector magnet on that side until the edge of the raster is a straight vertical line.

Repeat the procedure for the other side, using the other corrector magnet.

Check the top and bottom edges of the raster and adjust the magnets for best overall compromise.

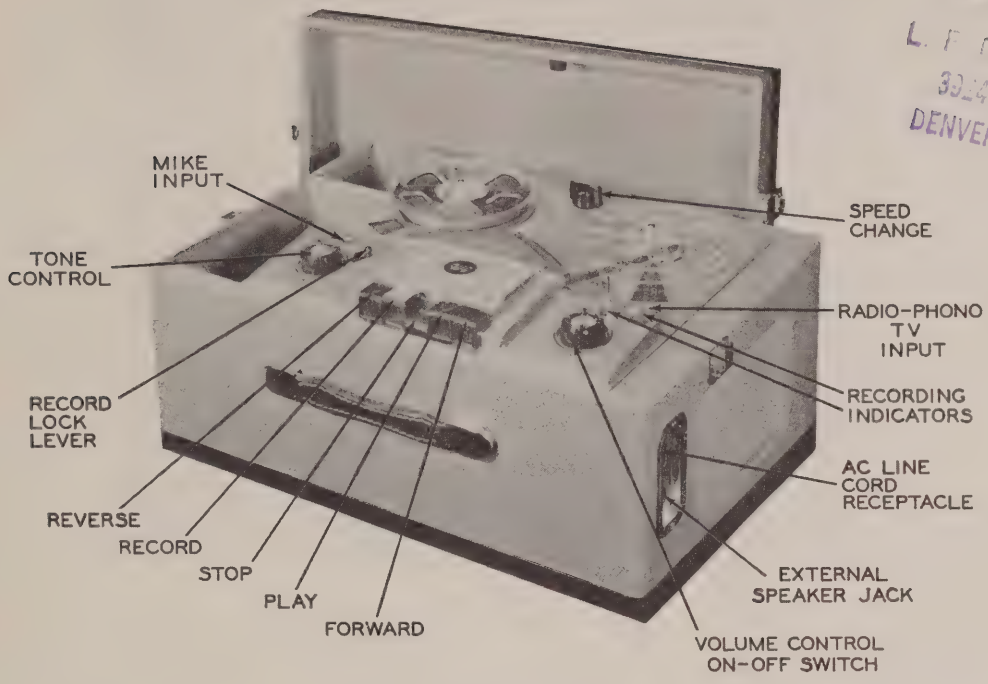
If the corrector magnets are adjusted the adjustment of the horizontal linearity slug should be checked.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

L. [illegible] UNIVERSITY OF
[illegible] LIBRARY
3824 MEADE ST.
DENVER, COLO.

WILCOX-GAY
MODEL 3F10



WILCOX-GAY
MODEL 3F10

GENERAL INFORMATION

The Wilcox-Gay "Recordio" Model 3F10 features fingertip operation for Fast Forward, Playback, Stop, Record and Fast Reverse. The "Recordio" is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time of a standard 5" or 7" reel of tape with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self-contained speaker or an external speaker through use of the Auxiliary Speaker Jack.

This "Recordio" has two tape speeds, 7 1/2" and 3 3/4" per second. Using both channels of the tape, the recording time is as follows:

SIZE	SPEED 3-3/4	SPEED 7-1/2
5" reel	1 hour	1/2 hour
7" reel	2 hours	1 hour

The 3F10 is designed to operate on 60 cycle, 115 volt, AC supply.

CAUTION: Severe Damage Will Result if Connection is Made to a Direct Current (DC) Line.

Manufactured by:

Wilcox-Gay Corporation
Brooklyn, N. Y. Charlotte, Mich.

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Figure 4.

4. After this track has been recorded the first track of recording is ready to be played without rewinding.

(a) Place the full reel of tape on the feed reel (left) spindle and the empty reel on the take-up (right) spindle.

(b) Thread the tape making sure the dull side of the tape faces the record head.

(c) Set the controls as described under "To Play a Recording".

To Play a Recording -

1. Thread the tape as described under "Threading the Tape".

2. Turn the On-Off Volume control on and allow thirty seconds for the tubes to warm up.

3. Depress the "Play" button until it is latched into position.

4. Adjust the Volume and Tone control to suit.

To Use an External Speaker -

Any size speaker of the permanent magnet type, having a 3 ohm voice coil, may be used by connecting a speaker extension cord acorss the voice coil of the speaker and then inserting the extension plug (same type as micorphone plug) into the External Speaker Jack located on the right side of the cabinet. This automatically cuts out the self-contained speaker.

To Edit and Splice Tape -

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excessive width.

Fast Forward and Fast Rewind -

High-speed forward or reverse wind can be obtained by pressing the desired button. These are used primarily in locating a desired portion of a recording in a few seconds.

CAUTION: The "Stop" button should always be depressed before changing functions or speeds. Always depress the "Stop" button when the Recordio is not in use.

Erasing Recorded Material -

Erasing of recorded material takes place automatically when new material is recorded; therefore, no special step is necessary to erase recordings before new recordings are made. However, if a portion of a recording or an entire reel of tape is to be completely erased, do so as follows:

1. Properly thread the tape on the machine.

2. Turn the Volume control knob clockwise until a click is heard. This turns the recorder on.

3. Press down on the Record button until it latches into position. The erasing of recorded material is now in process and may be stopped at any time by depressing the "Stop" button.

NOTE: Only one track of recorded material is erased at a time. To erase the second track, reverse the reels and repeat the above operation.

To Use Recorder as a Public Address System -

The recorder may be used for public address with or without recording the material at the same time. Plug in an external speaker as described in "To Use an External Speaker". Turn the recorder on and depress the Record button, but do not use tape. Be careful to maintain sufficient distance between the microphone and the external speaker to prevent feedback howl. If it is desired to record the program, thread the tape as previsouly described before depressing the Record button.

ADJUSTMENTS

Disassembly Instructions -

1. Remove two Phillips head screws from rear of case.

2. Remove push-on type volume and tone control knobs.

3. Remove two screws located under volume and tone control knobs. Remove escutcheon.

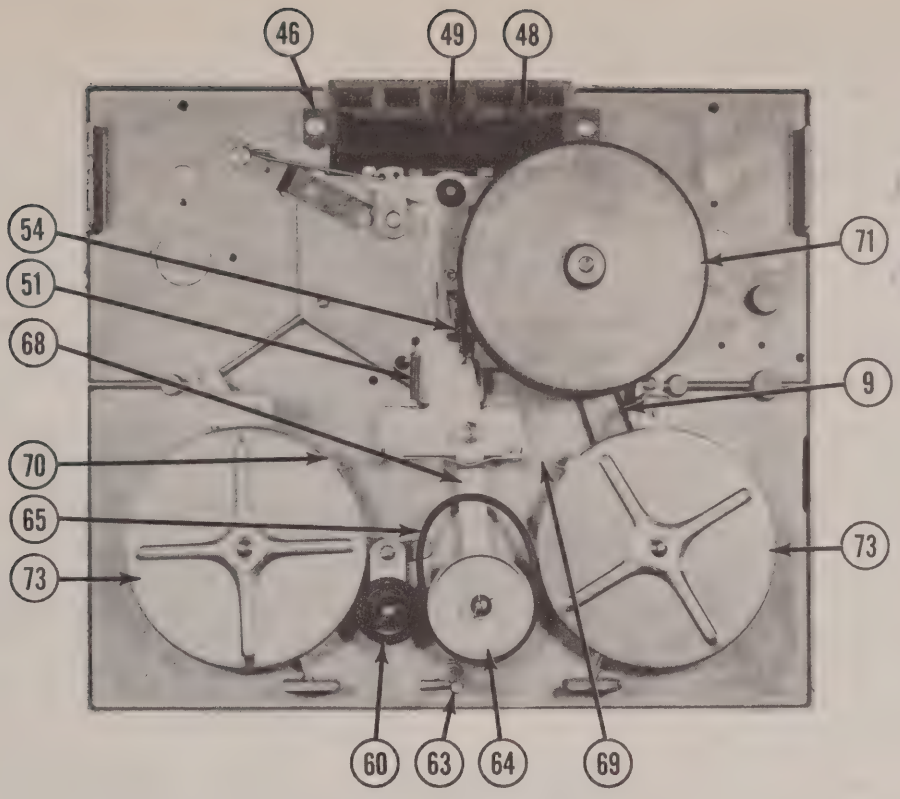

Figure 5.

4. Remove two hex head screws located under escutcheon.

5. Lift unit out of case, removing leads from speaker before removing unit completely.

Record-Play Head Adjustment
(See Exploded View) -

To adjust the record-play head (28) for maximum frequency response, make the following adjustment:

1. Remove the rear cover escutcheon (5).

2. Properly thread an alignment tape or a good recorded tape on the machine.

3. Set the controls as described under "To Play a Recording".

Grip the vertical portion of the record head mounting bracket with a pair of long-nosed pliers. Rock the mounting bracket and record head from side to side slightly until the maximum high frequencies are obtained. Bend the bracket with the pliers to obtain a permanent set at this position.

4. Replace the rear cover excutcheon (5).

Pressure Pad Adjustment (See Exploded View) -

1. Remove the front and rear escutcheons (5 and 11).

2. Depress the "Play" button. Do not turn the recorder on.

3. Use a pencil type postal scale and check the amount of pressure necessary to just pull the pad away from the tape. The test should be made on the end of the pressure pad mounting spring (37). Adjust the pressure pad for 1-3/4 oz. $\pm$ 1/4 oz. pressure.

(a) The record-head pressure pad is adjusted by the locked adjustment screw (44).

(b) The guide post pressure pad (43) is adjusted by bending the pressure pad spring. It must be adjusted for minimum pressure against the tape.

4. After the adjustments are made depress the "Stop" button and replace the trim covers.

Erase Head Adjustment -

1. With tape properly threaded, turn recorder on and depress the Record button. Allow tape to run for a few seconds then turn recorder off, but leave Record button depressed.

2. With the trim covers removed check the erase head (120), see Figure 2, to see if it is parallel with the tape, if not loosen screw (22) just enough so the head can be pivoted and align it with the tape then tighten the screw.

CAUTION: Make sure the head retracting spring (24), see Figure 6, remains in front of the erase head while adjusting it.

3. Check to see if the top edge of the tape coincides with the top end of the diagonal slot in the erase head (junction of long diagonal slot and short vertical slot). To adjust level of tape, loosen lock nut (20), see Figure 6, and rotate tape guide post (21) to move tape up or down. Tighten lock nut (20).

4. After this adjustment has been made, check to see if the tape moves forward approximately 1/64" when the "Record" button is depressed, if not, loosen the forward adjustment screw (23) and turn the screw in or out as required to obtain this 1/64" adjustment. Tighten the lock nut.

5. Replace the trim covers.

Brake Shoe Adjustment - (See Figure 5)

1. In order to adjust the brake shoes, the complete mechanism must be removed from the carrying case and the speaker disconnected.

2. With all push buttons in the up position the brake shoes (70) should clear the drums by approximately 1/8".

3. Depress the "Stop" pushbutton while observing the brake shoes. Both brake shoes must contact the drums at the same time and with equal pressure.

4. The adjustment is accomplished by bending the spring arm (69).

Adjustment for Slow Take-Up Reel-

There are some instances where the spring drive belt (9), see Figure 5, stretches after a period of time. In this case, the belt should be removed and shortened. Some belts have loops which are joined to form the continuous belt. See Note below regarding shortining belt.

NOTE: The spring belt is made so that one end will twist into the tip of the other end; therefore, clip the turns off the large end of the belt.

1. Clip off 3 to 5 turns of the spring belt.
2. Twist the ends together and replace the belt.

Bias Adjustment-

Turn the recorder on and depress the "Record" button; use no tape. To determine if the bias is within satisfactory limits without dismantling the unit, merely connect a VTVM from the top lug of the recording head to the chassis. If 75 to 100 volts are present no adjustment is necessary.

If the readings are outside of this range, proceed as follows:

1. Try a new 12AY7, 12AX7, 6AQ5 and 5Y3.

2. If still not within range, remove the chassis shield and connect a low capacity VTVM from Pin 2 of V2 to the chassis and adjust trimmer M5 (see Figure 8) to obtain a reading of 2.25 volts. This provides the optimum in performance.

TROUBLES

Push Buttons Fail to Latch into Position -

1. Lock plate spring (49) loose or broken, resulting in the lock plate not being held against the hinge bracket (46). See Figure 5.

Fails to Erase -

1. Spring (41) loose or broken, resulting in the erase head (120) not being pulled forward to engage the tape. See Figure 2.

2. Erase head not aligned properly. See "Erase Head Adjustment".

No Fast Forward or Reverse (See Figure 5) -

1. Idler lever tension spring (54) may be loose or broken; if so, the idler lever (68) will not be actuated. Replace spring (54).

2. Check idler drive belt (65), see Figure 6, to see if it is properly connected.

No Drive on Record or Playback (See Exploded View) -

1. Idler tension spring (98 or 99) loose or broken, thereby not holding idler wheel (76) in engagement with motor pulley (101) and flywheel (71).

2. Idler slide plate (97) binding on the slide bushing (96), thus preventing the idler from moving forward.

Tape Fails to Wind on Reel During Record or Playback -

1. Reel drive spring (9) loose or broken. See Figure 5.

Speed Variation or "Wow" (See Exploded View) -

1. Check capstan (67), pinch roller (31), idler (76), motor pulley (101), and flywheel (71) for oil or foreign material. Clean these parts with a good cleaning fluid.

2. Check motor pulley (101) to see if it is secured to motor.

3. Check idler tension spring (98 or 99); see if it is holding the idler engaged with motor pulley and flywheel.

4. Idler slide plate (97) binding on the slide bushing (96), preventing idler wheel (76) from making positive contact with motor pulley and flywheel.

Tape Overruns or Spills When Stop Button Is Depressed During Fast Forward or Rewind -

1. Brake shoes out of adjustment. See "Brake Shoe Adjustment".

2. Brake pads worn out. Replace pads.

Failure to Record -

1. Tape pressure pad not adjusted properly, resulting in the tape not being held against the recording head. See "Pressure Pad Adjustment".

2. Record head loose on its mounting. Adjust head and tighten into position as described under "Record-Play Head Adjustment".

DENVER, COLORADO

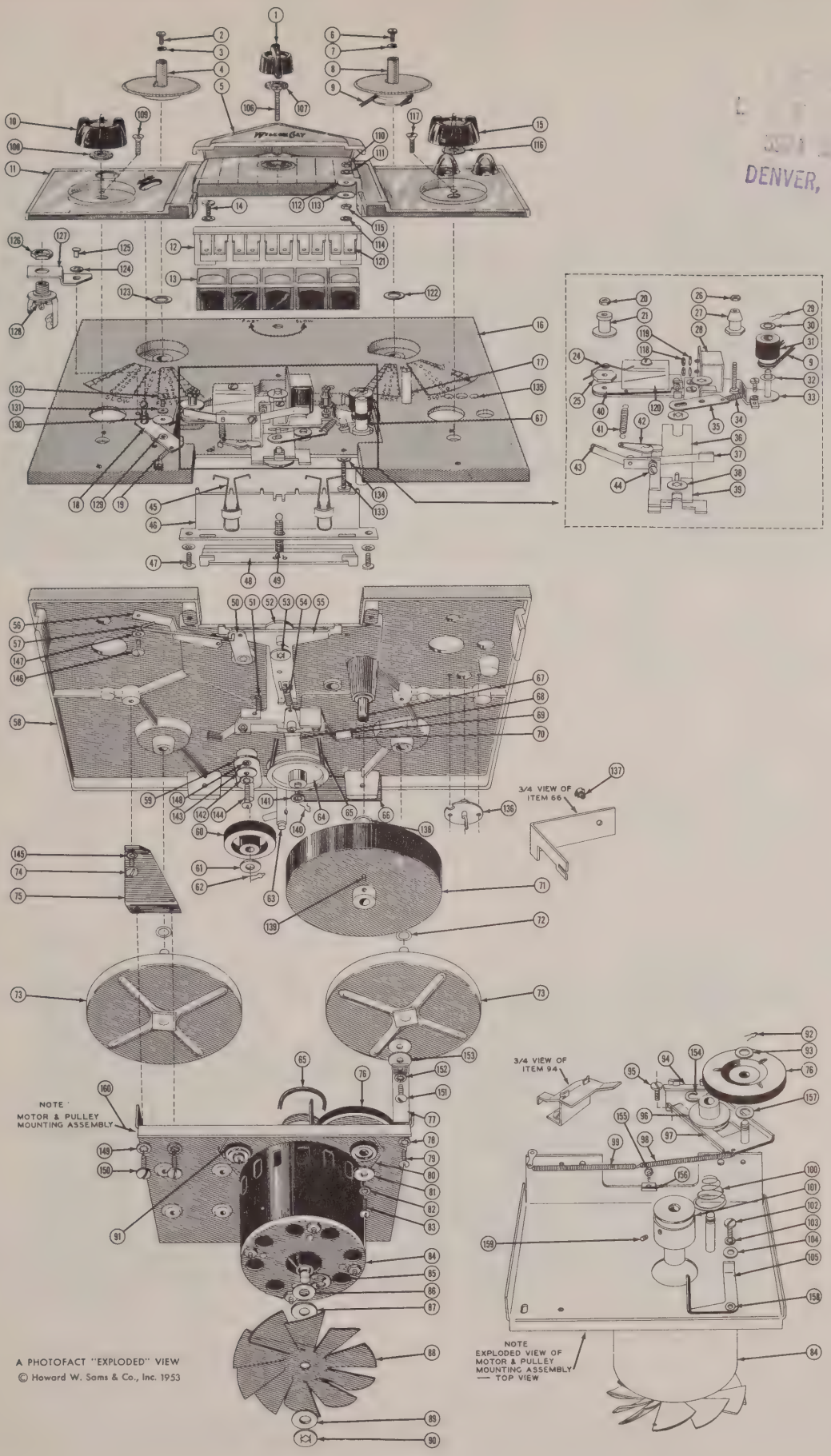
3/4 VIEW OF ITEM 66
3/4 VIEW OF ITEM 94
NOTE MOTOR & PULLEY MOUNTING ASSEMBLY
NOTE EXPLODED VIEW OF MOTOR & PULLEY MOUNTING ASSEMBLY — TOP VIEW
A PHOTOFACT "EXPLODED" VIEW
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Figure 6.

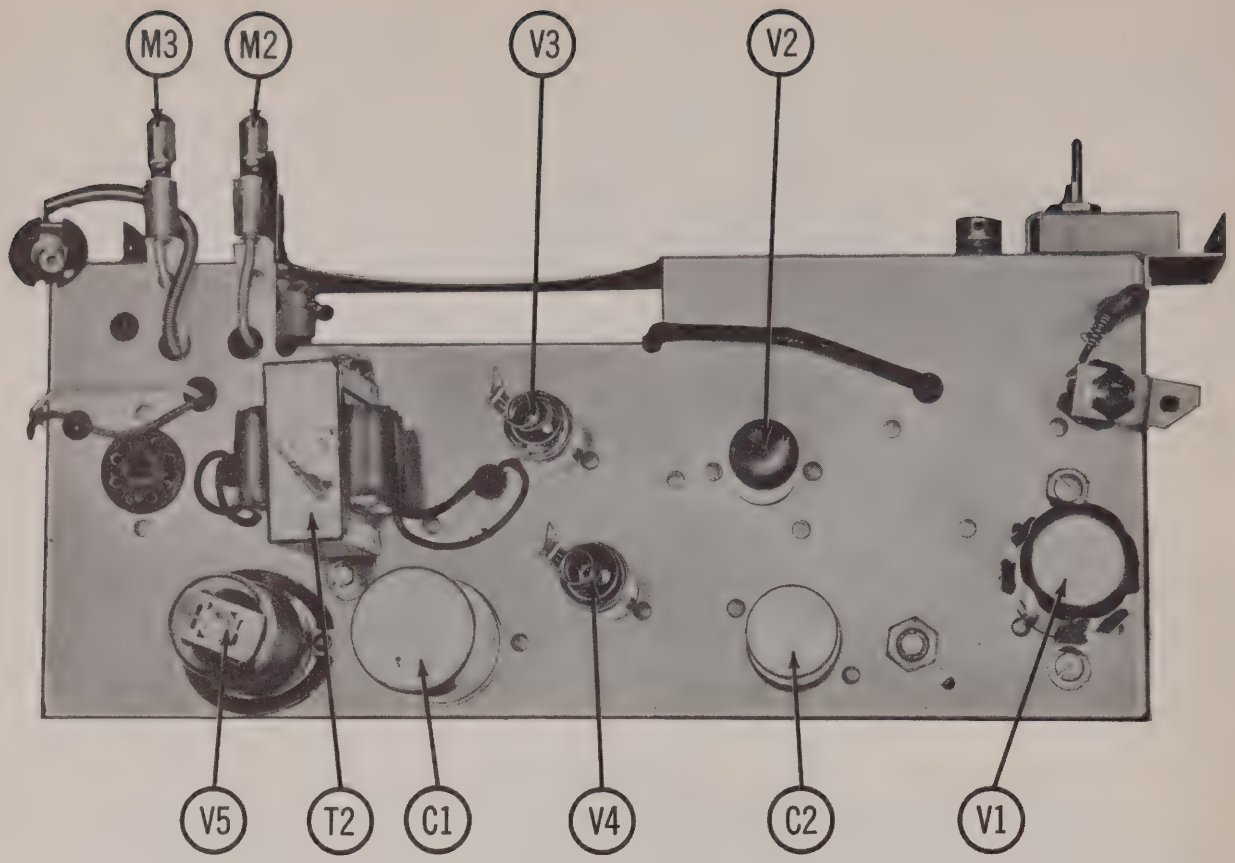


Figure 7.

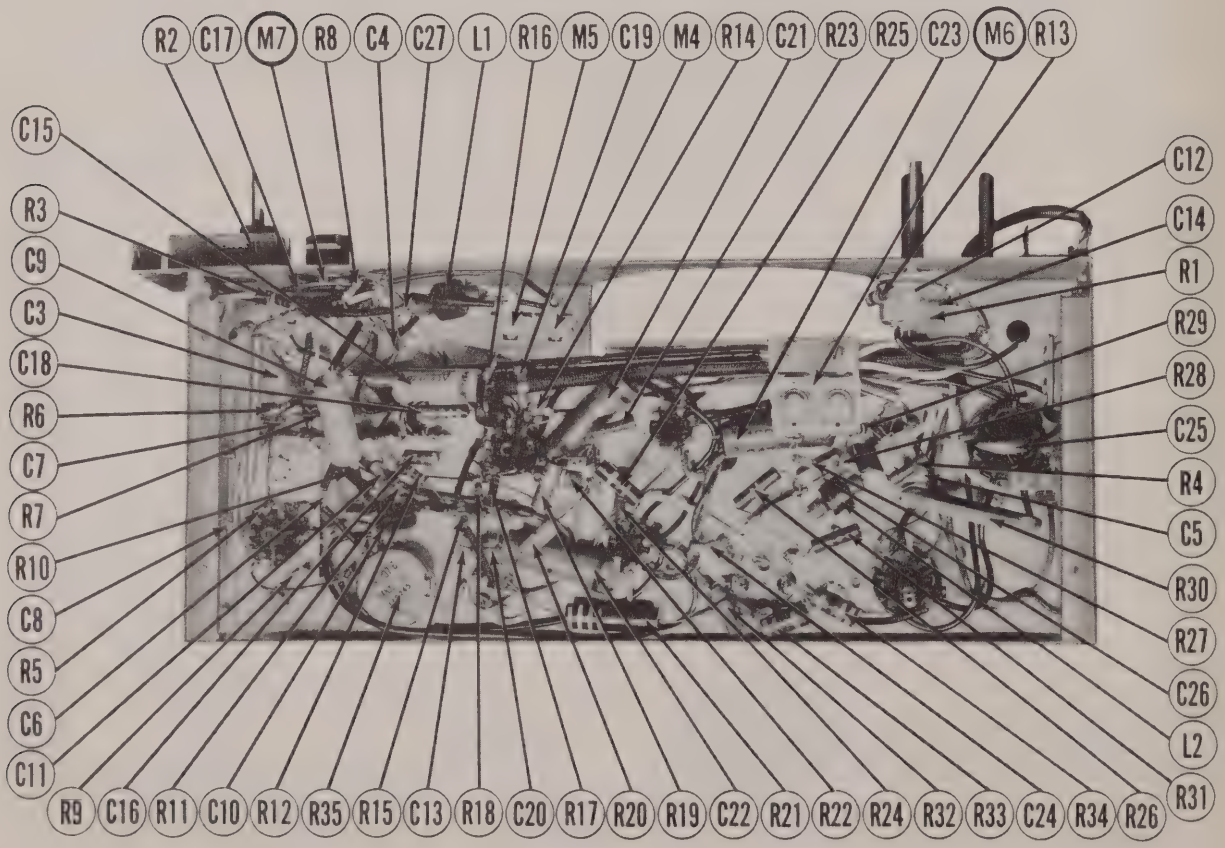
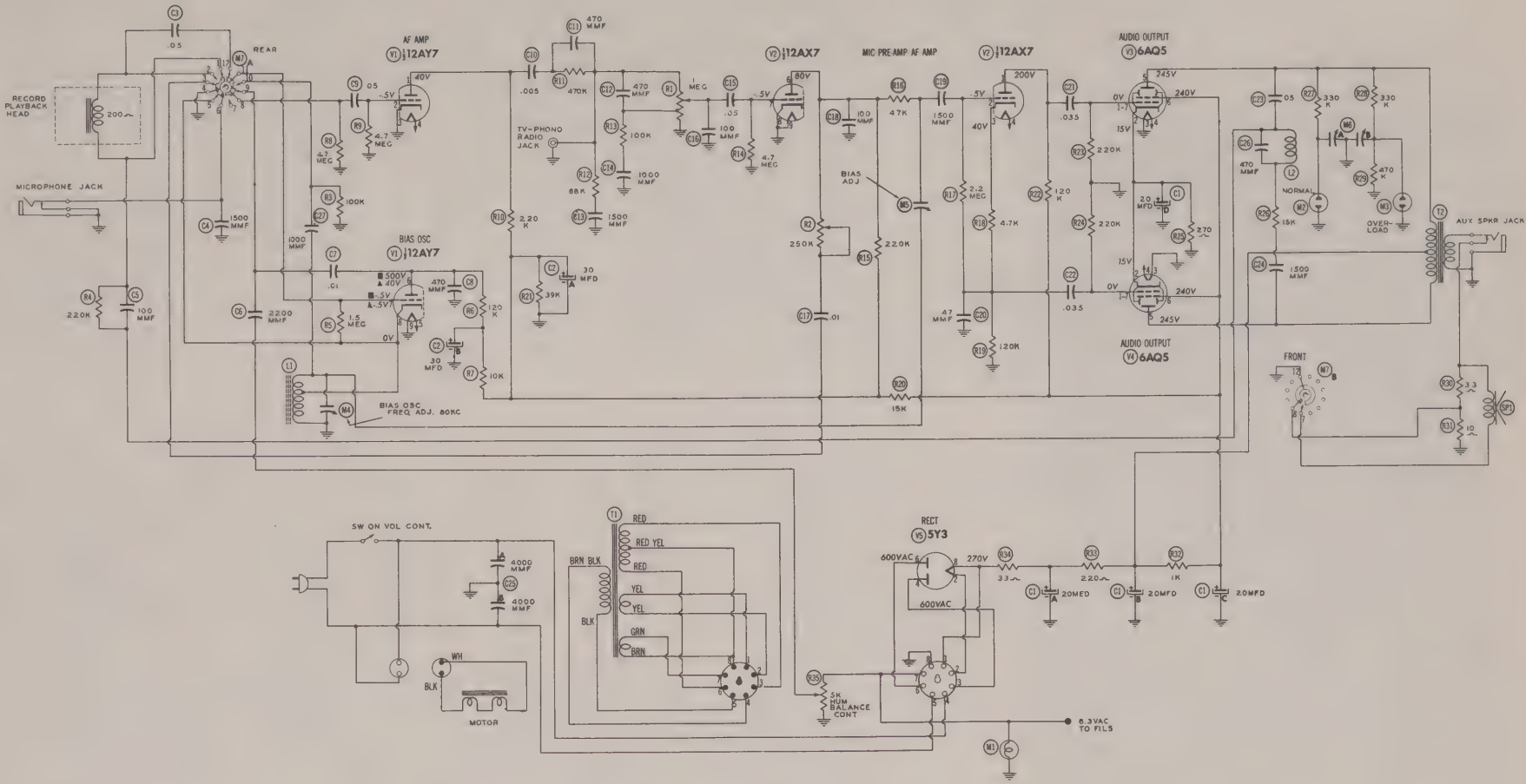


Figure 8.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AY7	†235KΩ	4. 7Meg	0Ω	0Ω	0Ω	†145KΩ	♦100KΩ ‡1. 5Meg	♦15Ω ‡0Ω	. 1Ω
V 2	12AX7	†120KΩ	2. 2Meg	125KΩ	0Ω	0Ω	†235KΩ	4. 7Meg	0Ω	. 1Ω
V 3	6AQ5	220KΩ	270Ω	. 1Ω	0Ω	†450Ω	†1. 3KΩ	220KΩ		
V 4	6AQ5	220KΩ	270Ω	. 1Ω	0Ω	†450Ω	†1. 3KΩ	220KΩ		
V 5	5Y3GT	INF	30KΩ	INF	105Ω	♦0Ω ‡2. 5Ω	105Ω	INF	30KΩ	

† MEASURED FROM PIN 8 OF V5
♦ TAKEN IN RECORD POSITION
‡ TAKEN IN PLAYBACK POSITION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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WILCOX-GAY
MODEL 3F10

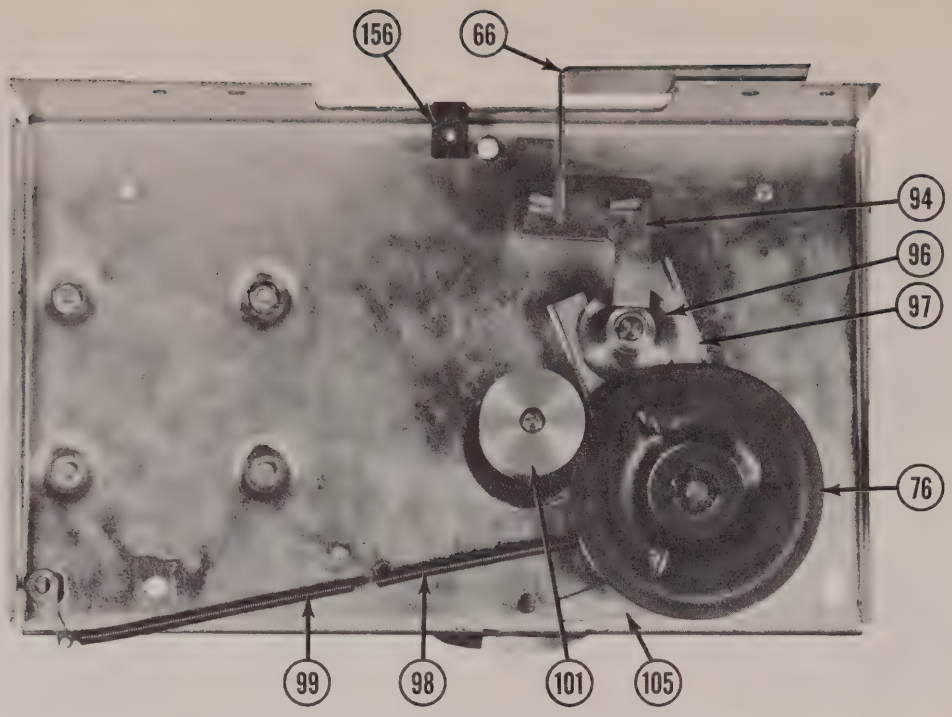

Figure 9.

3. Check the recording tape to see if the dull-coated side faces inward on the reel. If the dull side faces outward, a recording cannot be made. If this condition exists, wind the tape onto an empty reel, as described in "Threading the Tape".

CLEANING

The record head, capstan and pressure roller are subject to an accumulation of tape coating residue, which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to clean the head surfaces, capstan and pressure roller.

CAUTION: Do not use a brush when cleaning the recording head as this could possibly mar the laminations.

LUBRICATION

All rotating parts are provided with generous-size oilite bearings, which are factory lubricated and require no further attention.

An occasional cleaning out of foreign matter under the plastic pushbutton cover is desirable, and a small drop of oil on the sliding lever members is advisable.

Neon Record Level Indicators-

The neon record indicator firing level adjustment is only required if a neon bulb is replaced. The two neon record level indicators are adjusted for correct firing level by means of two trimmer capacitors, one for each indicator.

To adjust indicators proceed as follows:

1. Turn Recordio on and depress Record push button.

2. Connect a short jumper lead across the bias oscillator coil, L1 (short out the coil to disable the oscillator).

3. Connect an audio oscillator, set at 1000 cycles, into the microphone input jack. Output of audio oscillator should be approximately .01 volts. (A 1 volt output level may be used with a 100 to 1 reduction pad of resistors inserted between the audio oscillator and the microphone jack).

4. Connect probe of low capacity type AC VTVM to junction of 2-330KΩ resistors, R27 and R28, (mounted on terminal strip near volume control).

5. Adjust volume control to obtain a reading of 36 volts on VTVM and leave control set and VTVM connected.

6. Disconnect shorting jumper from across bias oscillator coil.

7. Adjust Normal indicator trimmer (M6A) fully clockwise and then turn slowly counterclockwise so that upon loosening the trimmer the Normal neon bulb barely lights. This adjustment must be made loosening the trimmer.

8. Short out bias oscillator coil.

9. Increase volume control to obtain a reading of 88 volts on the VTVM.

10. Remove short from bias oscillator coil.

11. Adjust Overload indicator trimmer (M6B) as described in step "7", for just barely lighting the Overload indicator bulb.

IMPORTANT: Do not readjust the recording bias oscillator adjustment after setting the indicator light adjustments.

ELECTRICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
V1		12AY7, AF Amp., Bias Osc.	R6	D-7.102-112	Resistor, 120KΩ, 1W, ±10%
V2		12AX7, Mic Pre-Amp, , AF Amp.	R7	D-7.101-58	Resistor, 10KΩ, 1/2 W, ±10%
V3		6AQ5, Audio Output	R8	D-7.101-178	Resistor, 4.7 Meg., 1/2 W, ±10%
V4		6AQ5, Audio Output	R9	D-7.101-178	Resistor, 4.7 Meg., 1/2 W, ±10%
V5		5Y3, Rectifier	R10	D-7.101-114	Resistor, 220KΩ, 1/2 W, ±10%
C1A	C-5.421-7	Electrolytic Cap., 20mfd.@ 450V.	R11	D-7.101-128	Resistor, 470KΩ, 1/2 W, ±10%
C1B		Electrolytic Cap., 20mfd.@ 450V.	R12	D-7.101-93	Resistor, 68KΩ, 1/2 W, ±10%
C1C		Electrolytic Cap., 20mfd.@ 450V.	R13	D-7.101-100	Resistor, 100KΩ, 1/2 W, ±10%
C1D		Electrolytic Cap., 20mfd.@ 25V.	R14	D-7.101-178	Resistor, 4.7 Meg., 1/2 W, ±10%
C2A	B-5.437	Electrolytic Cap., 30mfd.@ 250V.	R15	D-7.101-114	Resistor, 220KΩ, 1/2 W, ±10%
C2B		Electrolytic Cap., 30mfd.@ 250V.	R16	D-7.101-86	Resistor, 47KΩ, 1/2 W, ±10%
C3	D-3.100-18	Cap. Paper Tub., .05mfd.@ 200V.	R17	D-7.101-155	Resistor, 2.2Meg., 1/2 W, ±10%
C4	C-4.109-13	Cap. Ceramic Tub., 1500mmf.	R18	D-7.101-44	Resistor, 4.7KΩ, 1/2 W, ±10%
C5	C-4.109-29	Cap. Ceramic Tub., 100mmf. ±10%	R19	D-7.102-112	Resistor, 120KΩ, 1 W, ±10%
C6	C-4.111-4	Cap. Ceramic Tub., 2.2mmf.	R20	D-7.102-72	Resistor, 15KΩ, 1 W, ±10%
C7	D-3.100-7	Cap. Paper Tub., .01mfd.@ 400V.	R21	D-7.103-153	Resistor, 39KΩ, 2 W, ±10%
C8	C-4.109-2	Cap. Ceramic Tub., 470mmf.	R22	D-7.102-112	Resistor, 120KΩ, 1 W, ±10%
C9	D-3.100-18	Cap. Paper Tub., .05mfd.@ 200V.	R23	D-7.101-114	Resistor, 220KΩ, 1/2W, ±10%
C10	B-4.115-1	Cap. Disc, .005mfd.	R24	D-7.101-114	Resistor, 220KΩ, 1/2 W, ±10%
C11	C-4.109-2	Cap. Ceramic Tub., 470 mmf.	R25	D-7.102-221	Resistor, 270Ω, 1 W, ±10%
C12	C-4.109-2	Cap. Ceramic Tub., 470 mmf.	R26	D-7.102-72	Resistor, 15KΩ, 1 W, ±10%
C13	C-4.109-13	Cap. Ceramic Tub., 1500 mmf.	R27	D-7.101-121	Resistor, 330KΩ, 1/2 W, ±10%
C14	C-4.109-9	Cap. Ceramic Tub., 1000 mmf.	R28	D-7.101-121	Resistor, 330KΩ, 1/2 W, ±10%
C15	D-3.100-18	Cap. Paper Tub., .05mfd.@ 200V.	R29	D-7.101-128	Resistor, 470KΩ, 1/2 W, ±10%
C16	C-4.109-10	Cap. Ceramic Tub., 100 mmf.	R30	C-6.215-10	Resistor, W.W., 3.3Ω, 7W, ±10%
C17	D-3.100-7	Cap. Paper Tub., .01mfd.@ 400V.	R31	D-7.102, 217	Resistor, 10Ω, 1 W, ± 20%
C18	C-4.109-10	Cap. Ceramic Tub., 100mmf.	R32	D-7.102-23	Resistor, 1KΩ, 1 W, ± 10%
C19	C-4.109-13	Cap. Ceramic Tub., 1500mmf.	R33	D-7.103-58	Resistor, 220Ω, 2 W, ± 10%
C20	C-4.109-30	Cap. Ceramic Tub., 47mmf. ±10%	R34	D-7.103-23	Resistor, 33Ω, 2 W, ± 10%
C21	D-3.100-56	Cap. Paper Tub., .035mfd.@ 400V	R35	C-8.207-6	Hum Balance Cont. 5 KΩ
C22	D-3.100-56	Cap. Paper Tub., .035mfd.@ 400V	T1	D-9.262	Power Transformer
C23	D-3.100-20	Cap. Paper Tub., .05mfd.@ 600V	T2	C-9.261	Output Transformer
C24	C-4.109-13	Cap. Ceramic Tub., 1500mmf.	SP1	D-30.336	Speaker PM 6 x 9
C25A	B-4.131	Cap. Disc, 4000mmf.	L1	B-1.557	Bias Osc. Coil
C25B		Cap. Disc, 4000mmf.	L2	B-1.556	Tone Choke
C26	D-4.104-66	Cap. Mica, 470mmf. ±10%	M1		Pilot Lamp, Type #44
C27	C-4.109-9	Cap. Ceramic Tub., 1000mmf.	M2		Neon Lamp, Type NE51, Normal Indicator
R1	C-8.227-2	Volume Cont. & Switch, 1Meg., Tapped	M3		Neon Lamp, Type NE51, Overload Indicator
R2	C-8.231-1	Tone Cont., 250K			
R3	D-7.101-100	Resistor, 100KΩ, 1/2 W, ±10%	M4	C-4.134	Trimmer, Bias Osc. Freq. Adj. (3-35 mmf.)
R4	D-7.101-114	Resistor, 220KΩ, 1/2 W, ±10%			
R5	D-7.101-148	Resistor, 1.5 Meg., 1/2 W, ±10%	M5	C-4.134	Trimmer, Bias Adj. (3-35 mmf.)
M7A	B-11.230	Play/Record Switch (Viewed from rear)	M6A	C-4.133	Trimmer, Normal Indicator Adj. (3-35 mmf.)
M7B		Play/Record Switch (Viewed from front)	M6B		Trimmer, Overload Indicator Adj (3-35 mmf.)

MECHANICAL PARTS LIST

Ref No.	Part No.	Description	Ref. No.	Part No.	Description
1	C-13.253	Speed Shift Knob	20		Hex Nut, 6-32
2		Screw, 6-32 x 3/16 BHMS	21	B-32.276	Tape Guide Post (Left)
3		#6 Cantlink Lockwasher	22		Erase Head Adjustment Screw
4	B-13.261	Reel Pan for Feed Reel	23		Erase Head Forward Adjustment
5	D-13.264	Rear Escutcheon	24	B-31.346	Erase Head Retracting Spring
6		Screw, 6-32 x 3/16 BHMS	25	B-32.260	Tape Guide Post Spacer
7		#6 Cantlink Lockwasher	26		Hex Nut, 6-32
8	B-13.262	Reel Pan for Take-Up Reel	27	B-32.252	Tape Guide (Right)
9	B-31.330	Reel Drive Spring (Belt)	28	C-36.156	Recording Head, Shure #TR16A (Model 3A10)
10	C-13.254	Tone Control Knob			
11	E-13.265	Front Escutcheon		C-36.157	Recording Head, Shure #TR16 (Model 3A11)
12	B-19.858	Push Button Retainer Bracket			
13	B-13.258	Push Button (Maroon), 5 Used	29	B-33.409	Hairpin Clip
14		Screw, 6-32 x 7/16 RHMS	30	B-28.163	Linen Washer
15	C-13.254-2	Volume Control Knob	31	B-33.404	Pinch Roller
16	E-13.266	Base Plate	32	B-28.163	Linen Washer
17	B-32.282	Tape Guide Post	33	35.761	Pinch Roller Plate Assembly
18	35.775	Record Lock Lever Assembly	34	B-31.336	Pinch Roller Tension Spring
19	B-31.338	Record Lock Lever Return Spring	35	B-19.881	Playback Actuating Lever

MECHANICAL PARTS LIST (Cont.)

Ref. No.	Part No.	Description
36	35.758	Playback Slide Plate Assembly
37	B-19.892	Pressure Pad Spring
38	B-33.412	Speed Nut, 3/16 Stud
39	B-19.868	Record Slide Plate
40	B-19.872	Erase Head Plate
41	B-31.347	Erase Head Tension Spring
42	35.766	Record Actuating Lever Assembly
43	B-31.334	Felt Pad
44		Screw (Spring Adjusting) 6-32 x 3/8 RHMS
45	B-31.337	Push Button Return Spring
46	B-19.859	Hinge Bracket for Push Buttons
47		Screw, 6-32 x 1/4 Phillips Rd. Hd. M.S.
48	B-19.870	Locking Plate for Push Buttons
49	B-31.343	Lock Plate Spring
50	B-19.877	Switch Lever (Amplifier)
51	B-31.338	Brake Return Spring
52	C-19.869	Brake Slide Plate
53	B-33.412	Speed Nut, 3/16 Stud
54	B-31.339	Idler Lever Tension Spring
55	35.759	Shift Plate for High Speed Assembly
56	35.774	Record Interlock Spring Assembly
57	B-31.333	Switch Arm Link
58		(Bottom View of Item 16)
59	35.757	Sub-Idler Plate Assembly
60	B-33.405	Sub-Idler Wheel
61	B-28.163	Linen Washer
62	B-33.409	Hairpin Clip
63	35.763	Speed Control Shaft Assembly
64	B-33.406	Idler Drive Sheave
65	B-28.162	Idler Drive Belt
66	B-19.840	Idler Steady Bracket
67	B-32.259	Capstan Shaft
68	35.767	Idler Lever Assembly
69	B-19.844	Brake Arm
70	B-31.335	Brake Pad
71	C-13.257	Flywheel
72	B-28.163	Linen Washer
73	C-19.902	Brake Drum
74		Screw, 8-32 x 1/4 B.H.
75	B-19.863	Drive Mounting Plate Bracket
76	B-33.408	2-1/2" Rubber Bonded Idler
77	B-19.862	Angle Bracket
78		#8 Ext. Lockwasher
79		Screw, 8-32 x 3/8 R.H.
80	C-19.837	Motor Adaptor Plate
81		Washer (Flat), 1/2 x 3/16 x 1/32
82		Lockwasher, Internal #8
83		Screw (Sems), 8-32 x 5/8
84	D-36.153	Motor
85	B-33.418	Truarc Retaining "E" Ring
86		Washer (Flat)
87		Felt Washer, 3/4 x 1/4 x 1/16
88	C-19.887	Fan Blade, 4"
89		Felt Washer, 3/4 x 1/4 x 1/16
90	33.415	Push-on Fastener
91	B-28.159	Shock Mount
92	B-33.409	Hairpin Clip
93	B-28.163	Linen Washer
94	B-19.878	Speed Shift Lever
95		Screw, 6-32 x 1/4 BHMS
96	B-32.264	Idler Slide Bushing
97	35.768	Idler Pulley Switch Slide Plate Assembly
98	B-31.324	Idler Tension Spring
99	B-31.324	Idler Tension Spring
100	B-31.327	Idler Lift Compression Spring
101	B-32.262	Motor Pulley
102		Screw
103		Lockwasher, Internal #8
104		Washer (Flat), 1/2 x 3/16 x 1/32
105	B-19.879	Idler Throw Out Lever
106		6-32 x 1" O.C. Phil. Hd.
107		Felt Washer 3/4 x 1/4 x 1/16
108		Felt Washer 3/4 x 1/4 x 1/16
109		6-32 x 1/2 Phil. Hd. O.C.M.S.
110		6-32 x 1/4 Hex Nut
111		#6 Int. Lockwasher
112		3/8 x 1/8 x 1/32 Flat Washer
113		3/8 x 1/8 x 1/32 Flat Washer
114		#6 Int. Lockwasher
115		6-32 x 1/4 Hex Nut
116		Felt Washer 3/4 x 1/4 x 1/16
117		6-32 x 1/2 Phil. Hd. O.C.M.S.
118		2 x 56 x 3/16 Hex Nut
119		#2 Int. Lockwasher
120	35.756	Perm. Magnet Assembly
121	35.755	Push Button Lever Assembly
122	B-28.163	Linen Washer
123	B-28.163	Linen Washer
124		Washer
125		Rivet, .122 x 5/32
126		8-32 x 11/32 Hex Nut
127	B-19.883	Bracket (Input Jack)
128	B-33.400	Midget Jack
129	B-32.261	Shoulder Washer
130		Flat Washer 1/2 x 3/16 x 1/32
131		#8 Ext. Lockwasher
132		8-32 x 5/16 BHMS
133		6-32 x 1/2 BHMS
134		#6 Int. Lockwasher
135		Rivet, .122 x 5/32
136	B-33.370	Phono Jack
137		8-32 x 1/4 Undercut Flat Hd.
138	B-23.163	Linen Washer
139		8-32 x 3/16 Allen Hd. Set Screw
140	B-33.409	Hairpin Clip
141	B-28.163	Linen Washer
142		#8 Ext. Lockwasher
143		1/2 x 11/64 x 1/32 Flat Washer
144		8-32 x 3/8 RHMS
145		#8 Ext. Lockwasher
146		8-32 x 1/4 BHMS
147		#8 Ext. Lockwasher
149		#8 Ext. Lockwasher
150		8-32 x 1/4 BHMS
151		8-32 x 3/8 BHMS
152		#8 Ext. Lockwasher
153		1/2 x 3/16 x 3/64 Flat Washer
154	B-33.407-1	"C" Washer
155		#4 x 3/16 P.K. Screw Hex Hd.
156	B-19.916	Spring Clip
157	B-28.163	Linen Washer
158	B-32.261	Shoulder Washer
159		8-32 x 1/4 Allen Hd. Set Screw
160	35.753	Motor & Transf. Mtg. Assembly

PHOTOFACT* Folder

ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)

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MODEL K2260R-3

ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)

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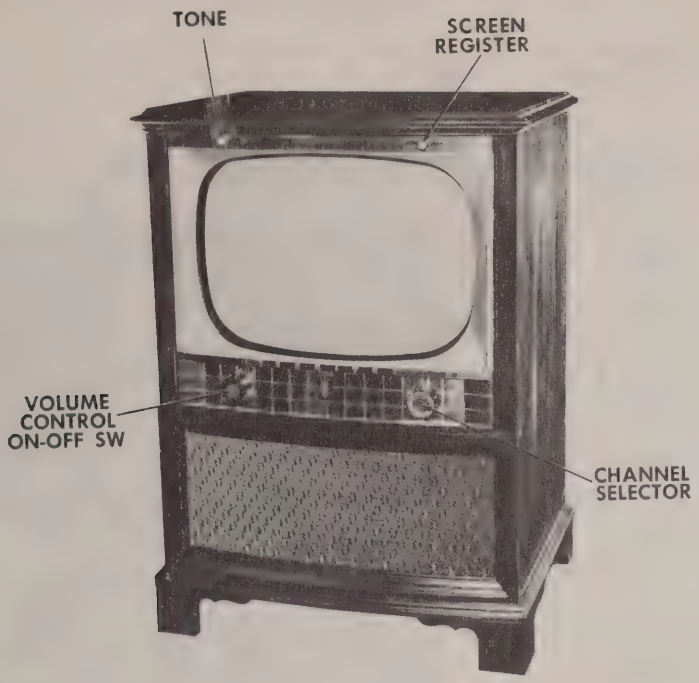
DATE 11-53 SET 220 FOLDER 12

PHOTOFACT* Folder

ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)



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ZENITH MODEL K-2260R-3

TRADE NAME	Zenith	MODELS	CHASSIS	RADIO CHASSIS
		K2260R-3	21K20-3	
		K2263E-3	21K20-3	
		K2266R-3	21K20-3	
		K2267E-3	21K20-3	
		K2271H-3	21K20-3	
		K2287R-3	21K20-3	8H20Z
		K2291E-3	21K20-3	10H20Z
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.			
TYPE SET	Television Receiver			
TUBES	Twenty-one			
POWER SUPPLY	110-120 Volts AC-60 Cycle		RATING 2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 Thru 13, Video 41.25MC, Sound IF 45.75MC (Intercarrier)			

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Tube Placement Chart (Top View) 5

FOR SERVICE INFORMATION ON RADIO CHASSIS 8H20Z, SEE PHOTOFACT SET 168, FOLDER 14; RADIO CHASSIS 10H20Z, SEE PHOTOFACT SET 159, FOLDER 18.

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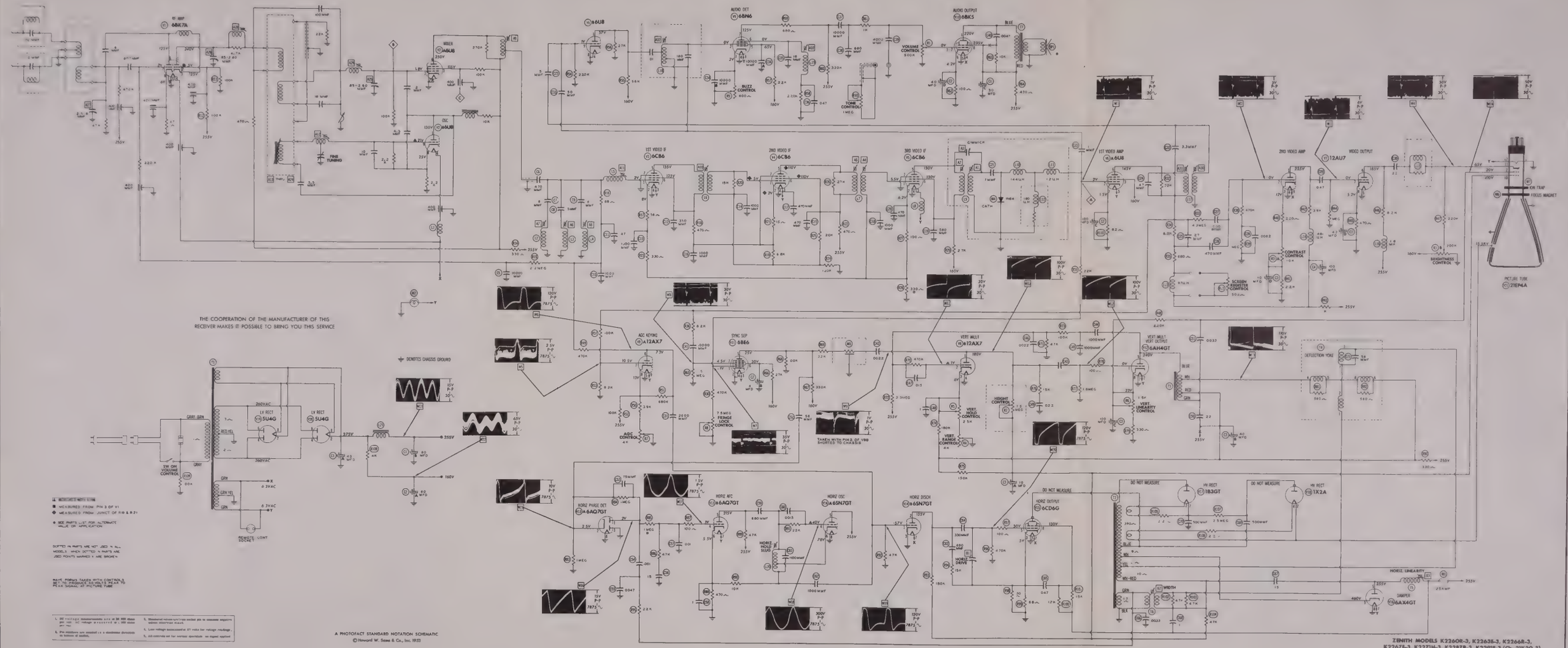
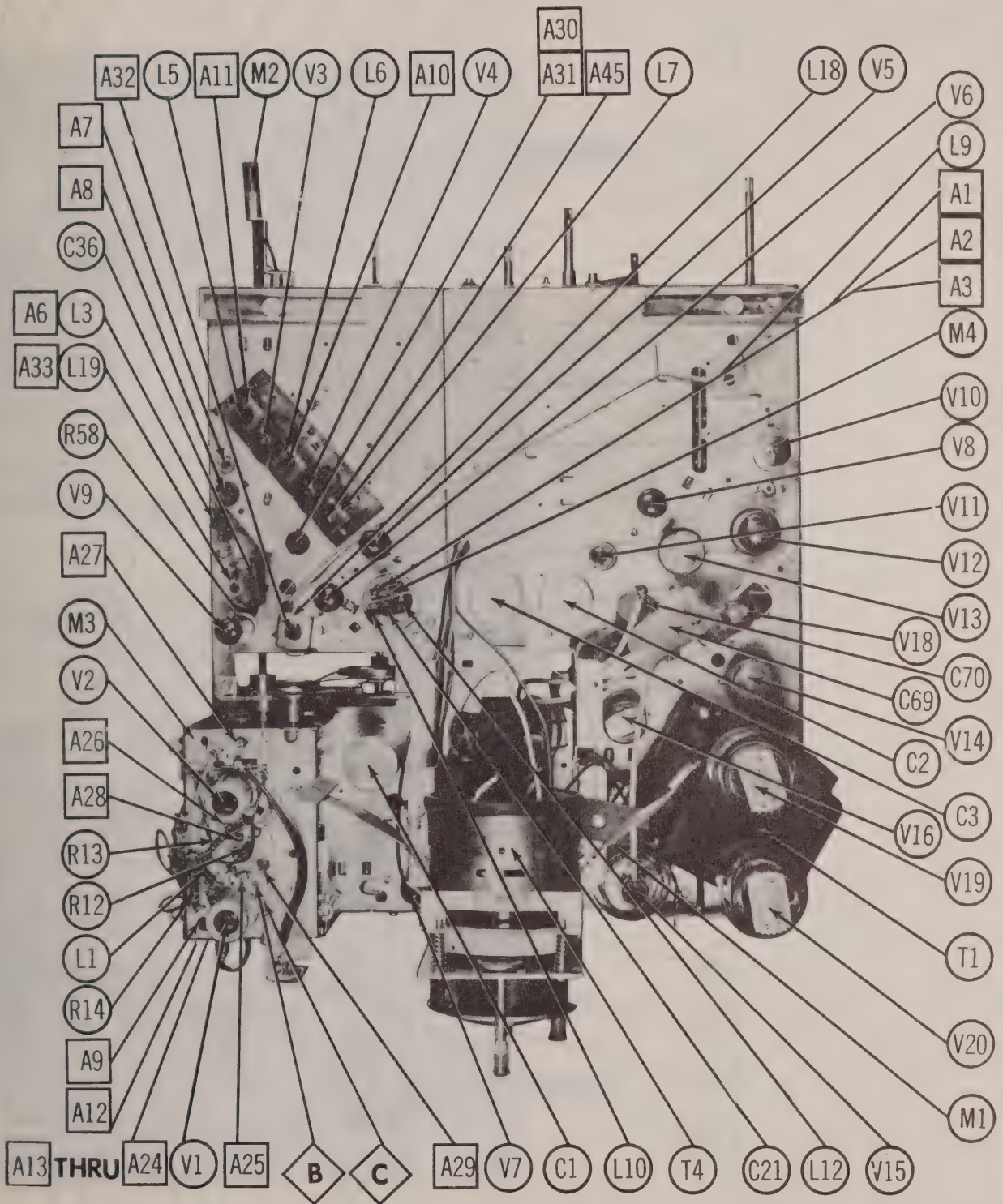
DATE 11 -53 SET 220 FOLDER 12

ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
DENOTES CHASSIS GROUND
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1953
ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)



CHASSIS TOP VIEW

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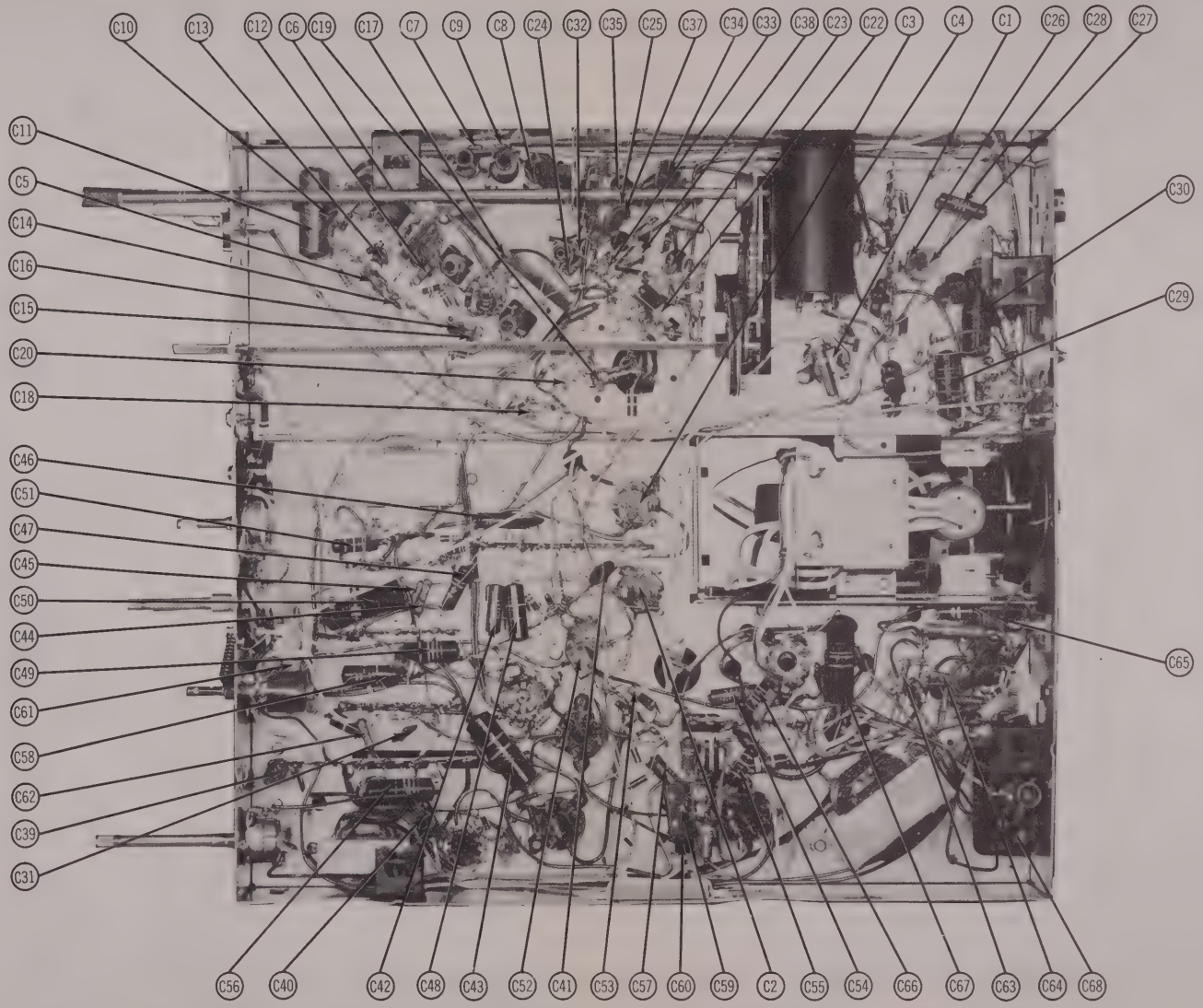

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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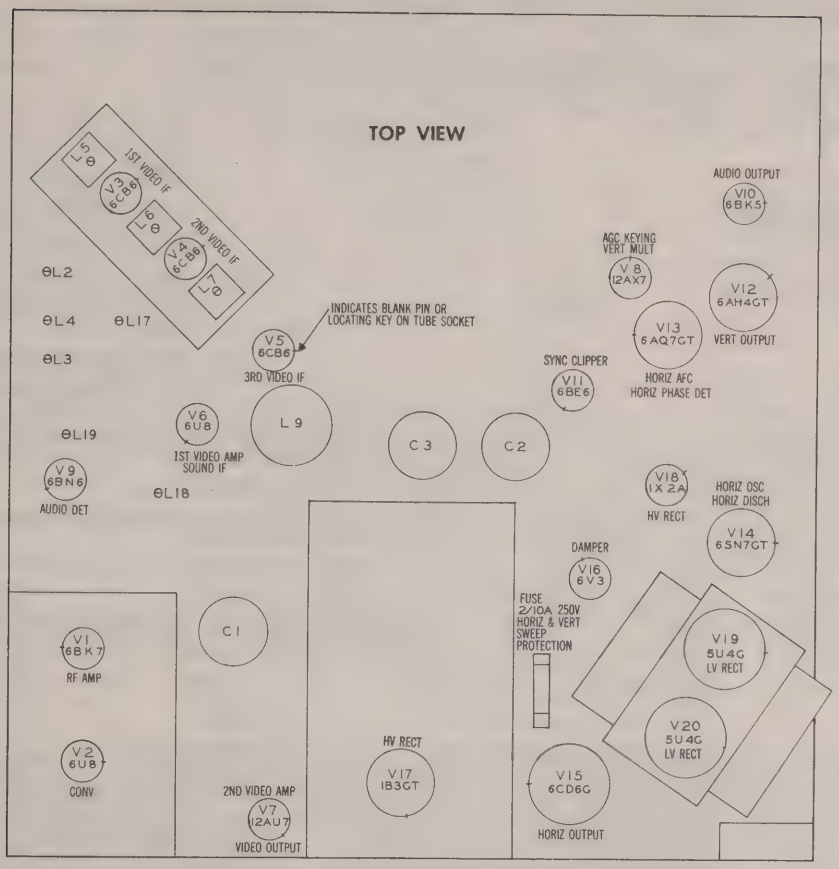

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V19, V20

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V21
Has pic, no sound - V6, V9, V10
Overloaded picture - V8

SYNC FAILURE
No vert. sync - V8, V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V18, V21, Fuse (M1)
No vertical deflection - V8, V12
Poor vert. linearity or foldover - V8, V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18, V19, V20
Vert. off freq. - V8, V11, V12
Horiz. off freq. - V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt battery to the ungrounded side of C10. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp)	44MC	Any non-interfering channel	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2, A3	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1. A3 is an adjustable "gimmick" which may be rotated with the fingers. Attenuate generator for 2 volt peak to peak on scope.
2.	"	High side to pin 1 (grid) of 6CB6 (V4). Low side to chassis.	"	"	"	"	A4, A5	Pre-set the bottom slug half way out of coil and the top slug all the way out of coil. Adjust for response similar to Fig. 2.
3.	"	High side to point (B). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A6, A7, A8	Remove the bias battery and set scope gain to amplify the trap region of the response curve. Adjust for MINIMUM marker amplitude.
4.	"	"	"	42.75MC 45.0MC 45.75MC	"	"	A9, A10, A11	Replace bias battery. Adjust for response curve similar to Fig. 3. If necessary, retouch A1 through A5 for desired response.

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A12 is to be made only if the adjustment of the individual channel oscillator adjustment fail to bring the channels with in the range of the fine tuning control. If channels 2 thru 6 fall within the range of the fine tuning control but the higher channels do not, slight readjustment of A12 may bring the higher channels in.
Connect the negative lead of a 1 volt bias to the ungrounded side of C10. Connect the positive lead to chassis.
Turn the oscilloscope gain up so that the sound trap notch in the response curve becomes visible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert. Amp. to point (A). Low side to chassis.	13	Adjust to place sound marker in notch as in Fig. 5.
			63MC (10MC Swp)	65.75MC	3		14	
			69MC (10MC Swp)	71.75MC	4		15	
			79MC (10MC Swp)	81.75MC	5		16	
			85MC (10MC Swp)	87.75MC	6		17	
			177MC (10MC Swp)	179.75MC	7		18	
			183MC (10MC Swp)	185.75MC	8		19	
			189MC (10MC Swp)	191.75MC	9		20	
			195MC (10MC Swp)	197.75MC	10		21	
			201MC (10MC Swp)	203.75MC	11		22	
			207MC (10MC Swp)	209.75MC	12		23	
			213MC (10MC Swp)	215.75MC	13		24	

RF AND MIXER ALIGNMENT

Leave the bias battery connected as under oscillator alignment.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	61.25MC 65.75MC	3	Vert. Amp. thru 10KΩ to point (C) (accessible on top of tuner). Low side to chassis.	A25 A26 A27	Adjust for response similar to Fig. 5.
7.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"	A28 A29	Adjustfor symmetry of response curve of as in Fig. 6.

FIG. 1

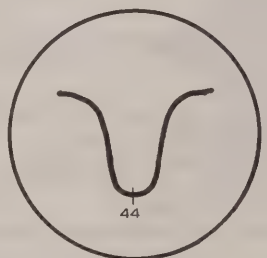

FIG. 2

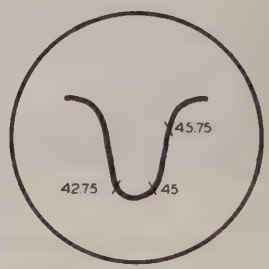

FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna. Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter-detector, as evidenced by a hiss similar to superregeneration.

Adjust the sound take-off transformer, (A30 and A31), the sound IF coil (A32), and the quadrature coil (A33), for maximum sound of best quality.

Adjust the buzz control R9 for minimum intercarrier buzz.

If the intercarrier buzz cannot be eliminated with the buzz control check the setting of the AGC delay adjustment.

If during the sound IF alignment the signal rises above the limiting level (hiss disappears) increase the attenuation until the hiss returns.

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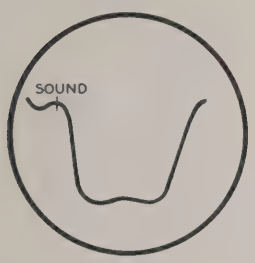


FIG. 4

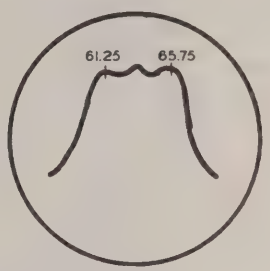


FIG.5

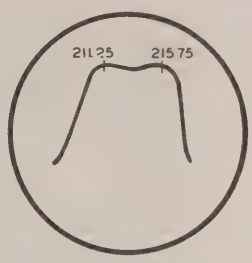
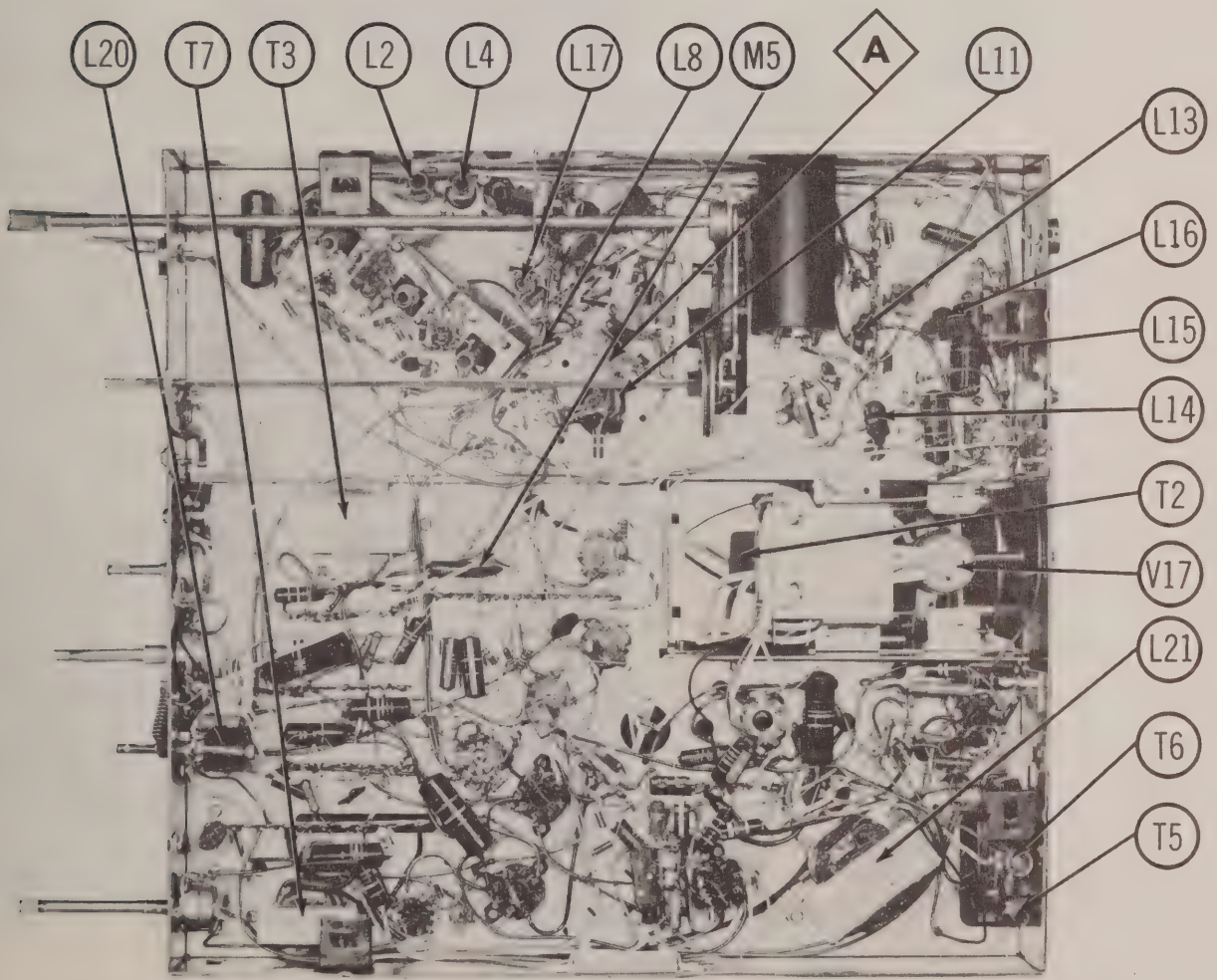


FIG.6



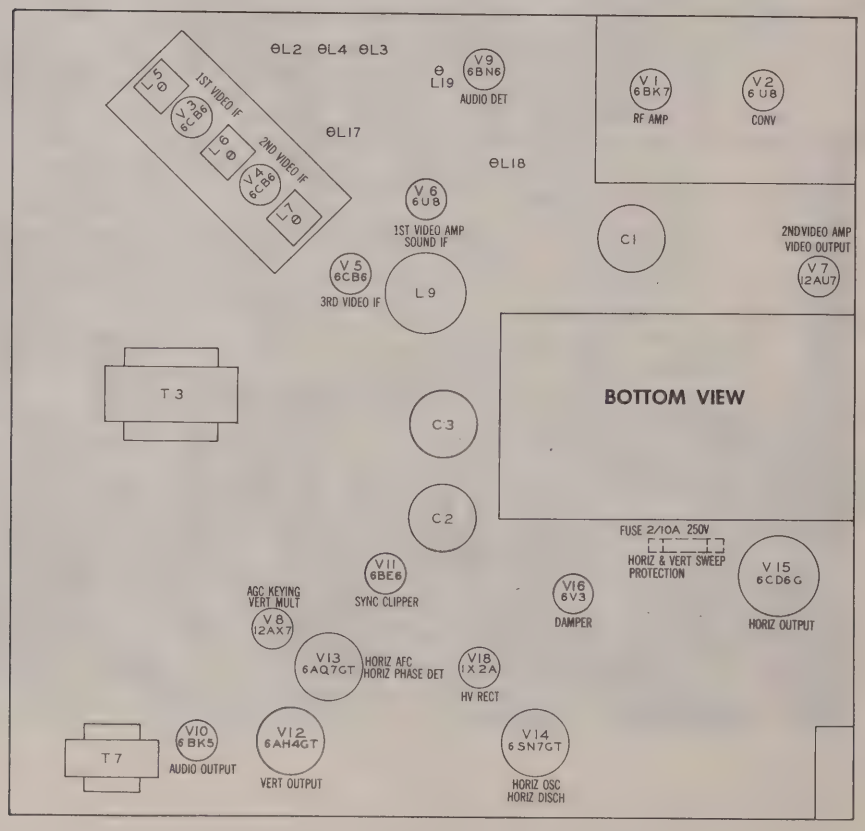
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR & ALIGN. IDENTIFICATION

ZENITH MODELS K2260R-3, K2263E-3, K2266R-3, K2267E-3, K2271H-3, K2287R-3, K2291E-3 (Ch. 21K20-3)

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7A	†875Ω	†55KΩ	INF	.1Ω	0Ω	INF	3.6Meg	47Ω	0Ω
V 2	6U8	†10.4KΩ	100KΩ	†100KΩ	.1Ω	0Ω	†405Ω	0Ω	2.2KΩ	4.4KΩ
V 3	6CB6	1.1Meg	715Ω	.1Ω	0Ω	■470Ω	■470Ω	0Ω		
V 4	6CB6	■6.8KΩ	■15Ω	.1Ω	0Ω	†545Ω	†545Ω	■0Ω		
V 5	6CB6	330Ω	430Ω	.1Ω	0Ω	†6.7KΩ	†6.7KΩ	0Ω		
V 6	6U8	†25KΩ	7.5Ω	†4KΩ	0Ω	.1Ω	†8KΩ	82Ω	0Ω	220KΩ
V 7	12AU7	†5KΩ	1.5Meg	3.3KΩ	0Ω	0Ω	†8.3KΩ	1Meg	470Ω	.1Ω
V 8	12AX7	♦2.8Meg	520KΩ	3.8KΩ	0Ω	0Ω	685KΩ	8.1KΩ	4.6KΩ	.1Ω
V 9	6BN6	320Ω	.2Ω	.1Ω	0Ω	†2.6KΩ	220KΩ	†330KΩ		
V 10	6BK5	†1KΩ	INF	40Ω	.1Ω	0Ω	100Ω	40Ω	†545 Ω	INF
V 11	6BE6	22KΩ	0Ω	.1Ω	0Ω	†90KΩ	†31KΩ	1.5Meg		
V 12	6AH4GT	1.8Meg	.1Ω	1.8Meg	INF	†800Ω	INF	0Ω		
V 13	6AQ7GT	2Meg	1Meg	0Ω	3Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 14	6SN7GT	47KΩ	♦200KΩ	0Ω	32KΩ	†75Ω	10.5KΩ	.1Ω	0Ω	
V 15	6CD6G	INF	0Ω	46Ω	INF	470KΩ	470KΩ	.1Ω	†6.8KΩ	TOP CAP ♦9Ω
V 16	6AX4GT	1.3Ω	INF	200KΩ	†75Ω	†82Ω	INF	.1Ω	0Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP ♦400Ω
V 18	1X2A	PINS 1 - 9 HAVE INF RESISTANCE								TOP CAP INF
V 19	5U4G	INF	17KΩ	INF	12Ω	INF	13Ω	INF	17KΩ	
V 20	5U4G	INF	17KΩ	INF	12Ω	INF	13Ω	INF	17KΩ	
V 21	21FP4A	0Ω	220KΩ	PIN 10 ♦47KΩ	PIN 11 †290KΩ	PIN 12 .1Ω				

† MEASURED FROM JUNCTION OF R108 AND L21
■ MEASURED FROM JUNCTION OF R19 AND C16
♦ MEASURED FROM PIN 3 OF V16.



TUBE PLACEMENT CHART

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the RF tuner oscillator circuit remove rear cover and supply power to set. Adjustments are made throught the hole marked "Bull's Eye" adjustment and are accessible one at a time as the selector switch is turned (fine tuning control must be at the center of its range before making adjustment).

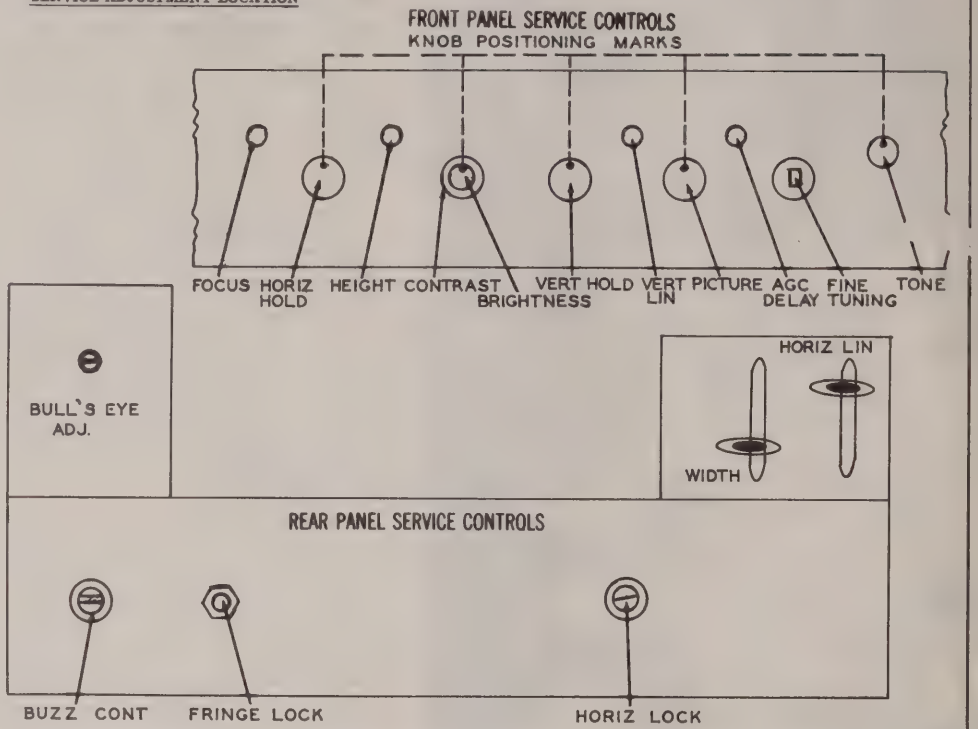
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions).

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again. Slightly retouch the fringe lock control adjustment, if necessary, for maximum stability while testing above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the front panel service controls. Adjust the horizontal hold control (L20) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on rear apron of chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location, see tube placement chart)

ANTI-PIN CUSHION CORRECTION

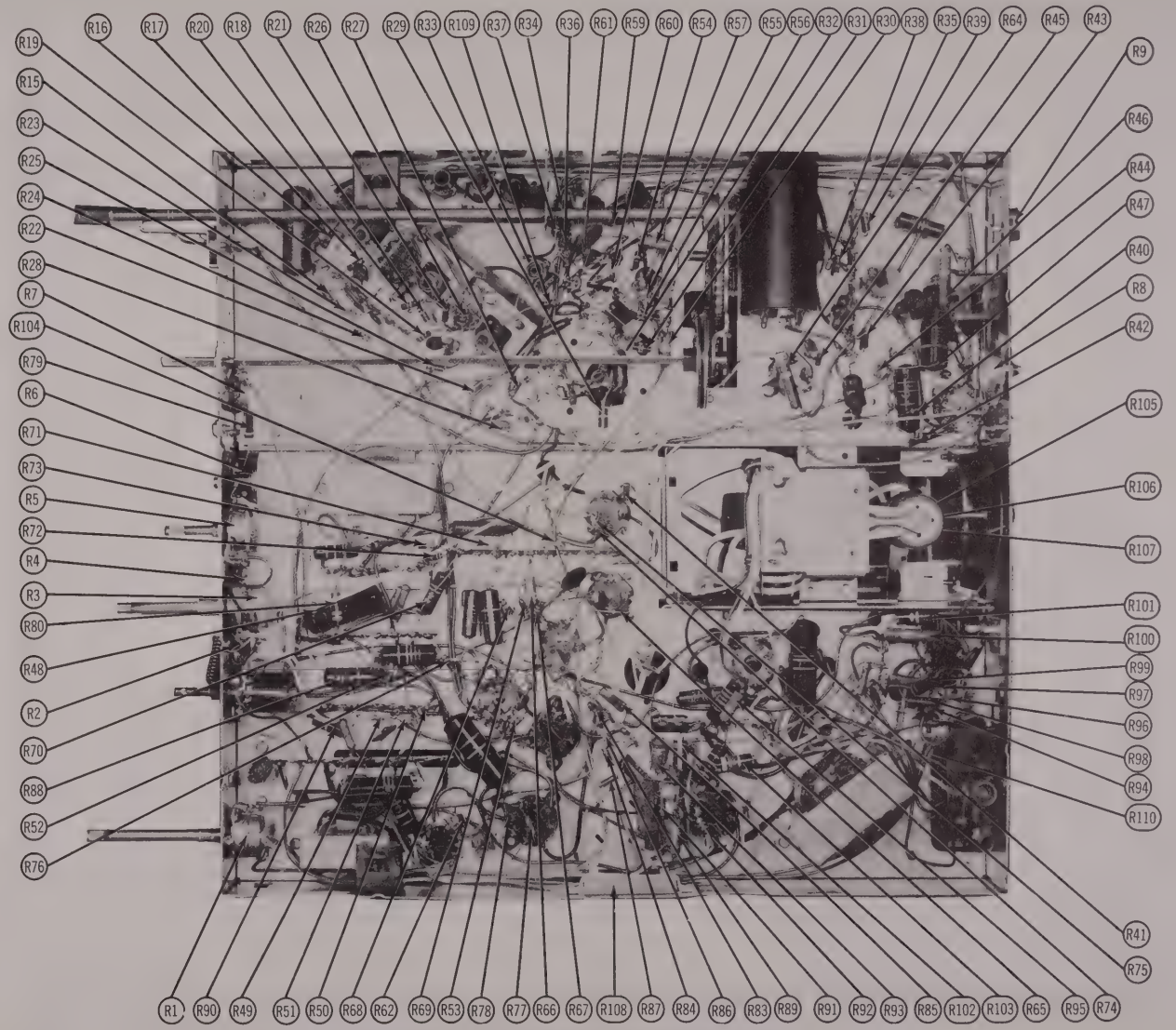
Adjust the vertical and horizontal size controls so that the corners and sides of the picture are visible.

Bend the corrector magnets arms for right angle corners and until opposite sides of the picture are parallel and straight.

Restore picture to normal size.

CENTERING

Centering is accomplished mechanically by adjusting two centering rods located on the PM focusing assembly. The centering rod at top is for vertical centering the one at bottom is for horizontal centering. Adjust both vertical and horizontal centering rods until picture is properly centered.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High voltage".

INSUFFICIENT SWEEP

Check by substitution V14, V15, V16, V19 and V20. Check adjustment of B1, B2 and B3. Check waveform at W20.

If Satisfactory	If Unsatisfactory
Check C65, R100, R101, C67, C68, T2, T4A and other associated circuit components.	Check C62, C63, C64, R92, R96 and other associated components.

DRIVE LINES

Check by substitution V14, V15 and V16. Check adjustment of horizontal drive trimmer (B1). Check C62, C63, C64, C65, C67, C68, T2, T4A and other associated circuit components.

COMPRESSED LEFT SIDE

Substitute V14, V15, V16, V19 and V20. Check adjustment of B1, B2 and B3. Check components associated with the horizontal sweep stages especially T2 and T4A.

FOLDS

Check by substitution V14, V15 and V16. Check components associated with the horizontal output stage especially C67 and C68.

XMAS TREE EFFECT

Check by substitution V13 and V14. Check associated circuit components especially C59, C60, C61, C62 and L20.

VERTICAL

LOSS OF SWEEP

Check by substitution V8 and V12. Check waveform at W12.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R80 and other associated circuit components.	Check C43, C44, C45 and other associated circuit components.

INSUFFICIENT SWEEP

Check by substitution V8 and V12. Check adjustment of height and vertical linearity controls. Proceed as outlined under "Loss of Sweep".

COMPRESSED AT BOTTOM

Check by substitution V8 and V12. Check associated circuit components especially C3C, T3 and T4B.

COMPRESSED AT TOP

Check by substitution V8 and V12. Check C43, C49 and other associated components.

FOLDS

Check by substitution V8 and V12. Check circuit components associated with V8B and V12.

SYNC

HORIZONTAL

LOSS OF SYNC

Check by substitution V13 and V14. Check waveform at W16.

If Satisfactory	If Unsatisfactory
Check components associated with V13 and V14.	Check C55, C57, C54, R95 and other associated circuit components.

CRITICAL HOLD

Substitute V13 and V14. Check components associated with these stages.

VERTICAL

LOSS OF SYNC

Check by substitution V8 and V11. Check waveform at W9.

If Satisfactory	If Unsatisfactory
Check components associated with V8B, especially C46 and C47.	Check integrator (M5), C42, C41 and other associated components.

CRITICAL HOLD

Check by substitution V8 and V11. Check waveform at W8 for signal overload and/or sync compression.

If Satisfactory	If Unsatisfactory
Check M5, C46, C47, C42 and other associated circuit components.	Check C41 and components associated with V6A and video detector assembly.

VIDEO

LOSS OF VIDEO

Substitute V7. Check C27, C29, C30, picture tube and other associated circuit components.

NEGATIVE PICTURE

Check by substitution V6 and V7. Check video detector crystal and detector assembly. Check components associated with V6A and V7 for failure or change of value.

POOR CONTRAST

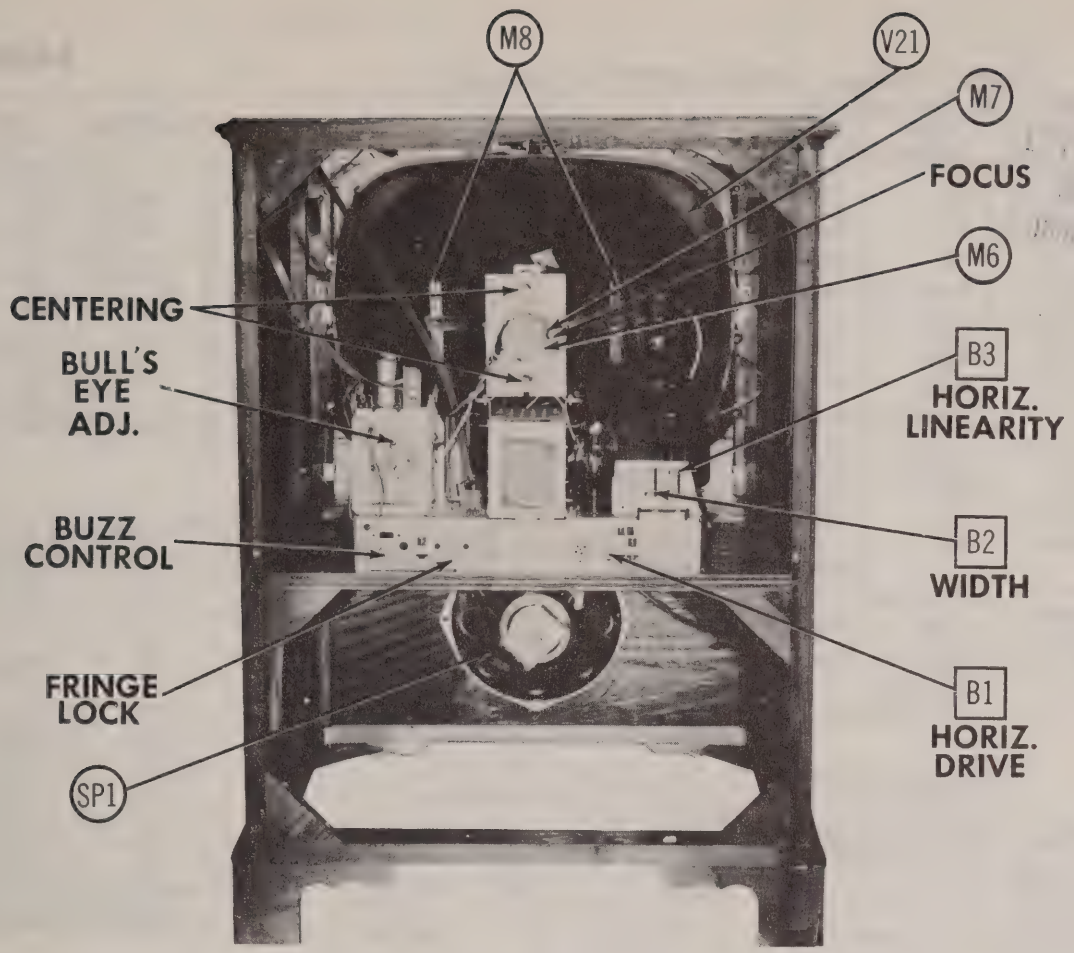
Check by substitution V6 and V7. Check associated circuit components especially coupling and bypass capacitors, peaking coils and plate load resistors.

SMEAR

Check by substitution V6 and V7. Check video detector crystal and assembly. Check C27, C29 and C30. Check L14, L15 and L16. Check R34, R35, R46 and R50 for change of value. Check picture tube and other associated circuit components.

ONE WIDE BLACK BAR ACROSS PICTURE

Check RF Tuner, video IF and video amplifier tubes for heater to cathode leakage. Check video IF and amplifier stages for filament lead dress shorts.



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) for greatest picture width.

Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug, B3, for a picture that is symmetrical from left to right.

AGC DELAY CONTROL ADJUSTMENT

Connect the vertical amplifier of an oscilloscope through 10KΩ to point Ⓐ. Select the strongest TV signal available and adjust the delay control for 2 volts peak output.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in antenna, speaker, tone and screen register.
4. Remove 2 wood screws on each side of CRT.
5. Remove 4 chassis bolts. Remove chassis.
6. Remove 2 speaker nuts. Remove speaker.

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	STANDARD REPLACEMENT	RTMA BASE TYPE	NOTES
V1	RF Amplifier	6BK7A	7BK7A	9AJ	
V2	Converter	6U8	6U8	9AE	
V3	1st. Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Amplifier-Sound IF Amp.	6U8	6U8	9AE	
V7	Video Amplifier-Horiz. Oscillator-Horiz. Discharge	12AU7	12AU7	9A	
V8	AGC Keying-Vert. Oscillator	12AX7	12AX7	9A	
V9	Video Output	6BN6	6BN6	7DF	
V10	Audio Output	6BK5	6BK5	9BQ	
V11	Sync Clipper	6BE6	6BE6	7CH	
V12	Vert. Output	6AH6GT	6AH6GT	8EL	
V13	Horiz. Phase Det-Horiz. AFC	6AQ7GT	6AQ7GT	8CK	
V14	Horiz. Oscillator-Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6CD6G	6CD6G	5BT	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	HV Rectifier	1X2A	1X2A	9Y	
V19	LV Rectifier	5U4G	5U4G	5T	
V20	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	SYLVANIA PART No.	GENERAL ELECTRIC PART No.	RTMA BASE TYPE	NOTES
V21	21EP4A	21EP4A	21EP4A	12D	① Circuit Changes Necessary
		21EP4 ①		12D	
		21FP4 ①		12C	
		21FP4A ①		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	≅40	400	22-2358			CD37		FP430.6	TVL-4783	
B	≅80	400				BR502A		TC77	TVA-1711	
C	≅30	400								
D	40	25								
C2A	≅80	350	22-2418	E4D596					TVL-6807	
B	≅4	350								
C	≅100	25								
D	40	25								
C3A	≅10	475	22-2368	K4D596		C104		FP396.2	TVL-4804	
B	≅40	400				BR102A		TC3501		
C	≅100	50								
D	10	25								
C4	100	400	22-2447	AFH2-61		CC36		FP240	TVL-2770	
C5	10000		22-3	BPD-01	DD-103	TM581	811-01	DC-511	5HK-81	
C6	470		22-2217	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C7	6		22-2051							
C8	5		22-2050	SI5NP0	TC2-4.7		NP0K-050	ZT-555	5TCCB-V47	
C9	6		22-2051							
C10	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C11	.47	200	22-2146	P288-47		P72P5		PT406	2TM-P47	
C12	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C13	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C14	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C15	470		22-2302	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C16	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C17	470		22-6	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C18	1000		22-7	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	560		22-2310	SI560	D6-561		GP2K-561		5GA-T56	
C20	470		22-6	BPD-00047	D6-471		GP2K-471	UC-5347	5GA-T47	
C21	7		22-1874				NP0K-010		5TCCB-V1	
C22	1		22-1762	SINP0	TC2-1		NP0K-050	ZT-555	5TCCB-V47	
C23	5		22-2050	SINP0	TC2-4.7		N080-338-470			
C24	47		22-1876	SI47N080						
C25	27		22-1606							
C26	470		22-2217	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C27	10000		22-3	BPD-01	DD-105	TM581	811-01	DC-511	5HK-81	
C28	.0062	200	22-2431							
C29	.047	600	22-1844	P288-047	DF-503	PTE6S47		PT6147	6TM-S47	
C30	4	400	22-1835	P288-22		PTE4P22		PT4025	4TM-P22	
C31	2000		22-8	BPD-002	DD-203	TM5D2	801-002	DC-522	5HK-D2	
C32	3.3		22-2343	SI3.3NP0	TC2-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C33	50		22-2460	SI50	D6-500	TM5S5	GP1K-500	UC-545	5GA-Q5	
C34A	10000		22-2376	BPD-2X01	DD3-103	TM5D81	811-01	DCD-511	5HK-281	
B	10000						811-01			
C35	10		22-1895	SI10NP0	TC2-10		NP0K-100	ZT-541	5TCC-Q1	
C36	.047	300	22-1778	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C37	10000		22-3	BPD-01	DD-103	TM581	811-01	DC-511	5HK-81	
C38	680		22-2320	SI680	D6-681		GP2K-681	UC-5368	5GA-T68	
C39	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	
C40	.0047	600	22-1849	P688-0047	D6-472	PTE5D47	GP2-333-472	PT5247	5TM-S47	
C41	10000		22-3	BPD-01	DD-103	TM581	811-01	DC-511	5HK-81	
C42	.0022	600	22-1845	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C43	.1	600	22-1841	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C44	1000		22-2126							
C45	1000		22-2128							
C46	.0022	600	22-1816	P688-0022	D6-222	PTE5D22	GP2-333-222	PT5222	6TM-D22	
C47	.015	300	22-2452	P688-015		PTE6S15			6TM-S15	
C48	.1	200	22-1777	P288-1	DF-104	PTE2P1		PT401	2TM-P1	
C49	.022	600	22-2129	P688-022		PTE6S22		PT6122	6TM-S22	
C50	.22	300	22-2187	P488-22		PTE4P22		PT4025	4TM-P22	
C51	.0033	600	22-2248							
C52	56	500	22-1831							

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	75	500	22-1256	1469-000075						
C54	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	MCB230	6TM-D1	
C55	.0047	400	22-1842	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C56	.15	200	22-2166	P288-15		PTE4P15			2TM-P15	
C57	.001	600	22-2127	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C58	.1	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C59	680	500	22-2125	1479-0007		2R5T7			M3-57	
C60	.0015	400	22-1785	P688-0015	D6-152	PTE6D15	GP2L-153	PT6215	6TM-D15	
C61	100	500	22-2416							
C62	1000		22-2112	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C63	680		22-2387	1479-0007		2R5T7			M3-57	
C64	330		22-2309	SI330	D6-331		GP2K-331	UC-5333	5GA-T33	
C65	.047	400	22-1775	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C66	.0033	600	22-2248							
C67	.15	400	22-2341	P488-15		PTE4P15			4TM-P15	
C68	.1	400	22-2240	P488-1		PTE4P1		PT401	4TM-P1	
C69	500	20000	22-1832	HV20C	TV3-502	MM-C20T5	413-501	HV20035A	20DK-T5	
C70	5000	20000	22-1833	HV20C	TV3-502	MM-C20T5	413-501	HV20035A	20DK-T5	
C71	56	2000								

CONTROLS

ITEM No.	RATING: RESISTANCE	WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2838	Q13-133	AG-60-2	AB-60	U-48	Volume & Switch
B	Shaft		Not Req.	C5	KSS-5	AK-4	D8-35	Attach to R1A
C	Switch		Not Req.	T6-1	SWB	KE-1	U8-28	Attach to R1A
R2A	7.5Meg with 1 Meg stop	½	63-2394	Q41-143*		AB-89*		Height
B	Shaft		Not Req.	Not Req.		AK-1		Attach to R2A
R3A	10KΩ	½	63-2825	Q7-359**		SBB-T17	UF14L	Contrast
B	200KΩ	½					UR254L	Brightness
C	Shaft						D8-35	Attach to R3A
R4	4000Ω	½	63-3183					Vert. Range
R5A	2500Ω	½	63-2834	Q41-112	AG-15-8	AB-7	U-8	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R5A
R8A	1500Ω	3	63-2812	WK-1500	A43-1500	VK-130	R1500L	Vert. Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A
R7	4000Ω	½	63-3183					AGC
R8A	7.5Meg	½	63-2805	Q41-142		AB-89	U-82	Fringe Lock
B	Shaft		Not Req.	Not Req.		AK-1	Not Req.	Attach to R8A
R9	800Ω	1	63-3167					Buzz-Wire Wound Tone
R10	1 Meg	½	63-3171					Screen Register
R11	500Ω	½	63-3172					

* Connect a 1 Meg resistor in series with right hand terminal of the control & the lead connecting to the same terminal of the original control. (Control viewed from shaft end, terminals down).
** CONCENTRIKIT EQUIVALENT-KIT K-2, BASE ELEMENTS & SHAFTS B17-116 & P1-128 (Panel B11-129 & R7-212 (Rear).

RESISTORS

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R12	100KΩ	½	63-1859		
R13	100KΩ	½	63-1859		
R14	330Ω	1	63-2288		
R15	2.2Meg	½	63-1926	BTS-2.2Meg	
R16	68Ω	½	63-1737	BTS-68	
R17	56Ω	½	63-1733	BTS-56	
R18	470Ω	½	63-1771	BTS-470	
R19	6800Ω	½	63-1820		
R20	18KΩ	½	63-1834		
R21	15Ω	½	63-1708	BTS-15	
R22	470Ω	½	63-1771	BTS-470	
R23	330Ω	½	63-1764	BTS-330	
R24	120KΩ	½	63-1873	BTS-120K	
R25	120KΩ	½	63-1873	BTS-120K	
R26	27KΩ	½	63-1845		
R27	100Ω	½	63-1743	BTS-100	
R28	330Ω	½	63-1764	BTS-330	Note 1
R29	2700Ω	½	63-1573	BTA-2700	
R30	470KΩ	½	63-1897	BTS-470K	
R31	22KΩ	½	63-1841	BTS-22K	
R32	22KΩ	½	63-1841	BTS-22K	
R33	4.3Meg-5%	½	63-1937	BTS-4.3Meg-5%	
R34	6200Ω-5%	2	63-1579	BTS-6200-5%	
R35	680Ω-5%	½	63-1777	BTS-680-5%	
R36	8200Ω-5%	½	63-1823	BTS-8200-5%	
R37	100KΩ	½	63-1869	BTS-100K	
R38	470KΩ-5%	½	63-1896	BTS-470K-5%	
R39	1 Meg	½	63-1981	BTS-1 Meg	
R40	220Ω	1	63-1757	BTS-220	
R41	2200Ω	½	63-1799	BTS-2200	
R42	3900Ω	½	63-1810	BTS-3900	
R43	1000Ω	½	63-1786	BTS-1000	
R44	1 Meg	½	63-1981	BTS-1 Meg	
R45	470Ω	½	63-1771	BTS-470	
R46	8200Ω	2	63-1801	BTS-8200	
R47	220KΩ	½	63-1883	BTS-220K	
R48	220KΩ	½	63-1883	BTS-220K	
R49	470KΩ	½	63-1897	BTS-470K	
R50	3900Ω	½	63-1810	BTS-3900	
R51	680KΩ	½	63-1904	BTS-680K	
R52	100KΩ	½	63-1862	BTS-100K	
R53	8200Ω	½	63-1824	BTS-8200	
R54	220KΩ	½	63-1886		
R55	56KΩ	½	63-1859	BTS-56K	
R56	27KΩ	½	63-1845		
R57	22KΩ	½	63-958	BTA-22K	
R58	220KΩ	½	63-1883	BTS-220K	

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R59	680Ω	½	63-1778		
R60	330KΩ	½	63-1890	BTS-330K	
R61	100Ω	½	63-1743	BTS-1000	
R62	100Ω	½	63-1743	BTS-100	
R63	10KΩ	1		BTA-10K	Note 2
R64	470Ω	2	63-2398	BTS-470	
R65	1.5Meg	½	63-1918	BTS-1.5Meg	
R66	27KΩ	½	63-1845	BTA-27K	
R67	330KΩ	½	63-1890	BTS-330K	
R68	100KΩ	½	63-1869	BTS-100K	
R69	33KΩ	½	63-1848	BTS-33K	
R70	470KΩ	½	63-1897	BTS-470K	
R71	47KΩ	½	63-1855	BTS-47K	
R72	3.3Meg	½	63-1932	BTS-3.3Meg	
R73	100KΩ	½	63-1869	BTS-100K	
R74	180KΩ	½	63-1880	BTS-180K	
R75	150KΩ	½	63-1876	BTS-150K	
R76	15KΩ	½	63-1834	BTS-15K	
R77	1.8Meg	½	63-1922	BTS-1.8Meg	
R78	100Ω	½	63-1743		
R79	330Ω	1	63-2288	BTA-330	
R80	330Ω	1	63-2288	BTA-330	
R81	560Ω	½	63-1775	BTS-560	
R82	560Ω	½	63-1775	BTS-560	
R83	1 Meg	½	63-1911	BTS-1 Meg	
R84	1 Meg	½	63-1911	BTS-1 Meg	
R85	1 Meg	½	63-1911	BTS-1 Meg	
R86	47KΩ	½	63-1855	BTS-47K	
R87	100Ω	½	63-1743		
R88	100Ω	½	63-1775	BTA-47K	
R89	47KΩ	1	63-1855	BTA-47K	
R90	10KΩ	2	63-1198	BTB-10K	
R91	22KΩ	½	63-1841	BTS-22K	
R92	47KΩ	½	63-1855	BTS-47K	
R93	150KΩ	1	63-2130	BTA-150K	
R94	15KΩ	½	63-1834	BTS-15K	
R95	22KΩ	1	63-958	BTA-22K	
R96	470KΩ	½	63-1897	BTS-470K	
R97	100Ω	½	63-1743		
R98	150Ω	1	63-2284	BTA-150	
R99	68Ω	2	63-2808	BW-2-68	
R100	12KΩ	2	63-1091	BTB-12K	
R101	15KΩ	2	63-942	BTB-15K	
R102	4700Ω	2	63-966	BTB-4700	
R103	4700Ω	2	63-966	BTB-4700	
R104	47KΩ	½	63-1855	BTS-47K	
R105	3.2Ω	½	63-2114		

RESISTORS (cont)

ITEM No.	RATING: OHMS	WATT	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	NOTES
R106	2.2Ω	½	63-2114		
R107	2.5Meg	2	63-2816		
R108	4000Ω	7	63-2794	1 3/4A-4000	
R109	100KΩ	½	63-1869	BTS-100K	
R110	8Ω	½	63-1740	BTS-8	

Note 1. Some models may use a 220Ω resistor in this application.
Note 2. Used only in radio and TV combinations.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	SEC. 1	SEC. 2	SEC. 3	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.
T1	117VAC	816VCT	5VAC	12.6VCT	95-1311			TP-300		
	⑥ 2A	.300ADC	⑥.6A	⑥2.5A						

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	RCA TYPE No.	NOTES
T2	41Ω tap ④10Ω, 12Ω, 21Ω	1.7Ω SEC. 2 0Ω SEC. 3 0Ω	S-19032						Horiz. Output Trans.
T3	399Ω tap ⑤ 29Ω, 39Ω		95-1209	A-8113①		TSO-13			Vert. Output Trans.
T4A	18Ω		95-1335	DY-9A	MDF-72	TY-3 ②	Y-17	21ID2	Horiz.Deflection Coils Vert. Deflection Coils
B	53Ω								
T5	8.5Ω		S-19342	WC-3①	MWC-3	TW-5 ①	WC-13③④	207R1③④	Horiz. Linearity Coil Width Coil
T6	1TΩ	2Ω	S-18748						

① Connect blue lead to plate and red lead to point of original B+. Tie green lead of transformer to white lead of yoke and connect to chassis ground. Tie yellow lead of transformer to red lead of yoke and connect to vertical blanking circuit.
② Use original deflection coil network.
③ Drill new mounting hole.
④ Do not use tap.
⑤ Connect to coded blue and green terminals.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	SEC.	DC RES. PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T7	6KΩ	3.1Ω	500Ω	.61Ω	95-1339	A-3877 ①	A-2930 ①	HO-9 ①	S-52	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1A	10"	PM	3.1Ω	40-649	10J11	10A4A	① Used in Models 2387R-3 and 2391E-3
B	12"	PM	3.1Ω	40-594 ①	12J11	12A4A	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	SEC.	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Fil. Choke	0Ω		30-391				
L2	41.25MC Trap	0Ω		S-18209				Less core, core part #149-111
L3	39.75MC Trap	0Ω		S-18744				Less core, core part #149-111
L4	47.25MC Trap	0Ω		S-18210				Less core, core part #149-111
L5	1st. Video IF	.1Ω		S-19736			6334	Less core, core part #149-111
L6	2nd. Video IF	.1Ω	.1Ω	S-17907			6333 †	Less core, core part #149-110
L7	3rd. Video IF	.2Ω	.1Ω	S-18730			6333 †	Less core, core part #149-111
L8	Fil. Choke	0Ω		S-16964			4613	9.5 Microhenries
L9	4th. Video IF	.3Ω	.4Ω	S-18740				Less core, core part #149-111 (Complete det. assy. part #8-18590)
L10	Series Peaking Coil	8Ω		S-17911	19-3160		4644	144 Microhenries
L11	Series Peaking Coil	1.5Ω		S-18128			4613	13 Microhenries
L12	Shunt Peaking Coil	6Ω		S-18751	19-3160 *	TV-154 *	4644 *	160 Microhenries, wound on resistor
L13	Shunt Peaking Coil	4.4Ω		S-17343	19-3093	TV-151	6177	97 Microhenries
L14	Shunt Peaking Coil	13Ω		S-17958	19-3500	TV-168	6174	481 Microhenries
L15	Series Peaking coil	8Ω		S-18750				Wound on resistor
L16	Shunt Peaking coil	26Ω		S-18749			4644	1.6 Millihenries
L17	1st. Sound IF	1.9Ω	3.6Ω	S-18568				Less core, core part #149-85
L18	2nd. Sound IF	.3Ω	Tap ⑥ .1Ω	S-19712				Less core, core part #149-96, includes .01 MMF Cap. (part #22-3)

PROPERTY OF
L. T. ANDERSON
3424 N. [illegible]

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L19	Quadrature Coil	4.6Ω		S-19001	20-1005			Less core, core part #149-110
L20	Horiz.Osc.	160Ω	(tap @ 80Ω)	S-19743	19-1577			Includes core, core part #149-131

† Detune trap.
* Add resistor in series

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L21	.300ADC	78Ω	2.85 Hy.	95-1310				

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	1/4Amp. 125V	136-22	83-1883	313.250 (3AG-1/4A-S/B)	357001	MDL-1/4	4405

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	Pilot Light	100-67	Channel Indicator, Type #47
M3A	RF Tuner	S-18770	(Early Production)
B	RF Tuner	S-19840	(Late Production)
M4	Crystal Diode	103-1	Video Detector, Type 1N64
M5	Integrator	87-1	
M6	Focus Magnet	S-19661	Includes centering device
M7	Ion Trap	S-17164	
M8	Correction Magnet	S-18763	(2 Used)
B1	Trimmer Cap.	22-2398	Horiz. Drive
	Cabinet	14-1449R	Model K2260R-3
	Cabinet	14-1457E-	Model K2263E-3
	Cabinet	14-1461R	Model K2266R-3
	Cabinet	14-1465E	Model K2267E-3
	Cabinet	14-1559H	Model K2271H-3
	Cabinet	14-1472R	Model K2287R-3
	Cabinet	14-1462E	Model K2291E-3
	Back	S-19694	All Models except K2287R-3 and K2291E-3
	Back (TV)	S-19894	Models K2287R-3 and K2291E-3
	Back (Radio)	S-19213	Model K2287R-3
	Back (Phono)	2-299	Model K2287R-3
	Back (Phono)	2-292	Model K2291E-3
	Safety Glass	192-159	
	Escutcheon	57-1891	
	Control Cover	24-595	
	Escutcheon	57-1658	Radio Dial, Model K2287R-3
	Escutcheon	57-1864	Radio Dial, Model K2291E-3
	Escutcheon	57-1862	"Radiorgan" (RH) Model K2291E-3
	Escutcheon	57-1863	"Radiorgan" (LH) Model K2291E-3
	Dial Glass(Radio)	192-138	Models K2287R-3 and K2291E-3
	Scale	26-502	Channel Indicator
	Disc	27-184	Channel Indicator
	Knob	46-1017	Brightness
	Knob	46-1018	Contrast
	Knob	46-1005	Vert. Hold
	Knob	46-1118	Horiz. Hold
	Knob	46-1119	Screen and tone (2 used), Model K2260R-3, K2266R-3, K2271H-3, K2287R-3
	Knob	46-1120	Screen and tone (2 used), Model K2263E, K2267E-3, K2291E-3
	Knob	46-1133	Off/On Volume, Models K2260R-3, K2266R-3, K2271H-3, K2287R-3
	Knob	46-1134	Off/On Volume, Models K2263E-3, K2267E-3, K2291E-3
	Knob	46-1052	Fine Tuning
	Knob	46-1131	Channel Selector, Models K2260R-3, K2266R-3, K2271H-3, K2287R-3
	Knob	46-1132	Channel Selector, Models K2263E-3, K2267E-3, K2291E-3
	Knob	46-873	Tone (Radio) Model K2287R-3
	Knob	46-876	Tuning (Radio), Model K2287R-3
	Knob	46-1041	Tuning (Radio), Model K2291E-3
	Knob Assy.	S-19782	Off/On Volume (Radio), Model K2287R-3
	Knob Assy.	S-19316	Off/On Volume (Radio), Model K2291E-3

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANK
DENVER, COLO.

AUDIO

WEAK OR NO SOUND

Check by substitution V6, V9 and V10. Check stage of V10 by shorting to ground, momentarily, pin #3 of V10. A loud noise should result.

If Satisfactory	If Unsatisfactory
Check alignment of the sound IF and gated beam detector stages. Check associated circuit components.	Check components associated with V10.

BUZZ

Align audio detector using procedure outlined in the alignment section. If buzz is still objectionable substitute V9 and realign.

DISTORTED

Check by substitution V6, V9 and V10. Check audio output stage using an audio signal generator and scope. Apply audio signal across volume control. Connect scope across the secondary of T7.

If Satisfactory	If Unsatisfactory
Check sound IF and audio detector alignment and components.	Check components associated with V10 especially T7 and SP1.

POWER

DEAD SET

If filaments fail to light check AC interlock assembly switch on volume control and T1. If filaments light check V19 and V20. Check B+ filter and decoupling components.

SMALL and/or DIM RASTER

Substitute V19 and V20. Check B+ filter and decoupling components.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check fuse M1. Check by substitution V14, V15, V16, V17 and V18. Check waveform at W20.

If Satisfactory	If Unsatisfactory
Check R105, R106, R107, C69, C70, T2, T4A and other associated components.	Check components associated with V14 and V15.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V14, V15, V16, V17, V18, V19 and V20. Proceed as outlined under "Loss of High Voltage".

BLOOMING

Check by substitution V18, V17, V16, V15, V14, V19 and V20. Check R105, R106, R107, C69, C70, T2, T4A, picture tube and other associated components.

GENERAL

RASTER SOUND NO PIX

See "Loss of Video".

RASTER NO SOUND NO PIX

Check by substitution V1, V2, V3, V4, V5 and V6. Check video detector and other associated components.

NO RASTER NO SOUND NO PIX

See "Dead Set".

TOTAL LOSS OF SYNC

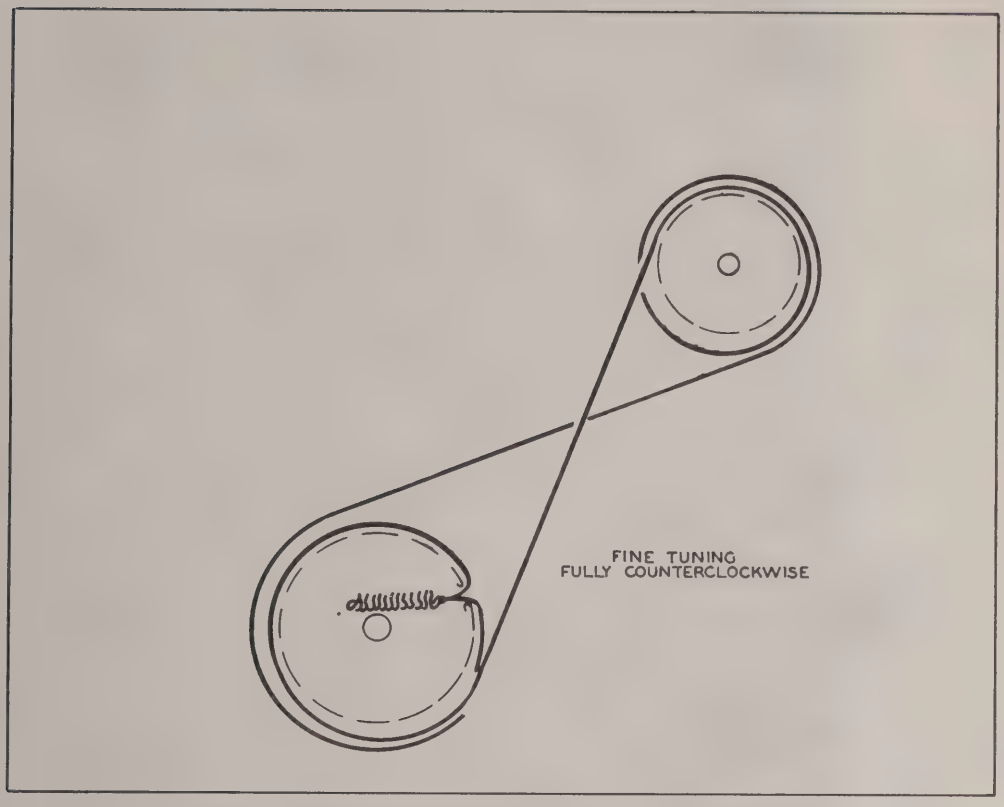
Substitute V11. Check all components associated with this stage especially all sync coupling capacitors.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

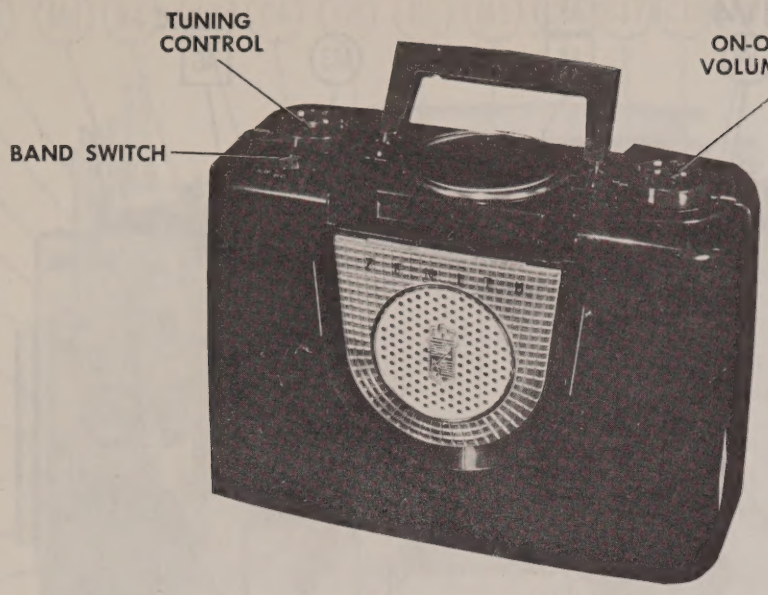
Symptoms shown are assumed and are not indicative of the quality and workmanship of this receiving equipment.

PROPERTY OF
L. F. KLAN
DENVER, COLORADO



FINE TUNING DRIVE CORD STRINGING

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



ZENITH
MODEL L406R (Ch. 4L42)

ZENITH
MODEL L406R (Ch. 4L42)

TRADE NAME	Zenith Model L406R (Ch. 4L42)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	Three Power Portable Two Band Superheterodyne Receiver
TUBES (Four)	Types 1L6 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output
POWER SUPPLY	110-120 Volts AC-DC (or) 9 Volts "A" Supply & 90 Volts "B" Supply in Pack Form
RATING	.15 Amp. @ 117 Volts AC (or) 50MA @ 9 Volts DC & 14MA @ 90Volts DC
TUNING RANGE—BROADCAST	535-1620KC SHORT WAVE 4.6 - 16.1MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
During Steps 5 thru 7 batteries should be placed on top of cabinet to simulate normal operating conditions.
To set pointer turn tuning gang fully closed and align the dot between "55" and "160" with the index mark on the chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1L6 (V1). Low side to B-.	455KC (400~Mod)	BC	600KC	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	Fig. 1	High side through dummy to antenna. Low side to B-.	16.1MC	SW	Tuning gang fully open	"	A5	Adjust for maximum output.
3.	"	"	4.6MC	"	Tuning gang closed	"	A6	"
4.	"	"	15.5MC	"	15.5MC	"	A7	Adjust for maximum output while rocking tuning gang.
5.		Loop	1620KC	BC	Tuning gang fully open	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
6.		"	1400KC	"	1400KC	"	A9	"
7.		"	600KC	"	600KC	"	A10	Adjust for maximum output while rocking tuning gang.

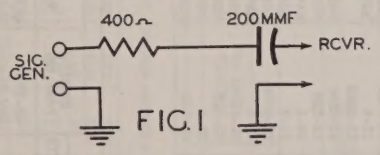


FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RTMA BASE TYPE	NOTES
		ZENITH PART No.	STANDARD REPLACEMENT		
V1	Converter	1L6	1L6	7DC	
V2	IF Amplifier	1U4	1U4	6AR	
V3	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V4	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▬80	150	22-2394	AFH4-01		DO01		FP311.7	R1040	
B	▲20	150								
C	■40	150								
C2	200	10	22-2395	PRS12/250		BRH1225A			TVA-1131	
C3	220	500	22-1461	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C4	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	.68		22-1766		TCZ-.68		NP0K-R68			
C6	.02	200	22-1386	P488-02	DD-203	PJ2S2		PT412	2TM-S2	
C7	100	500	22-1442	1469-0001		5R5T1		MCB235	MS-31	
C8	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	UC-5240	5HK-D4	
C9	270	500	22-2058							
C10	.02	200	22-1386	P488-02	DD-203	PJ2S2		PT412	2TM-S2	
C11	.003	400	22-326	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C12	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C13	110		22-5	SI110	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C14	.02	200	22-1386	P488-02	DD-203	PJ2S2		PT412	2TM-S2	
C15	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C16	.002	600	22-492	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C17	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C18	10000		22-3	BPD-01	DD-1032	TM5S1	811-01	DC-511	5HK-S1	
C19	.05	200	22-829	P288-05		PJ2S5		PT415	2TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	63-2790	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

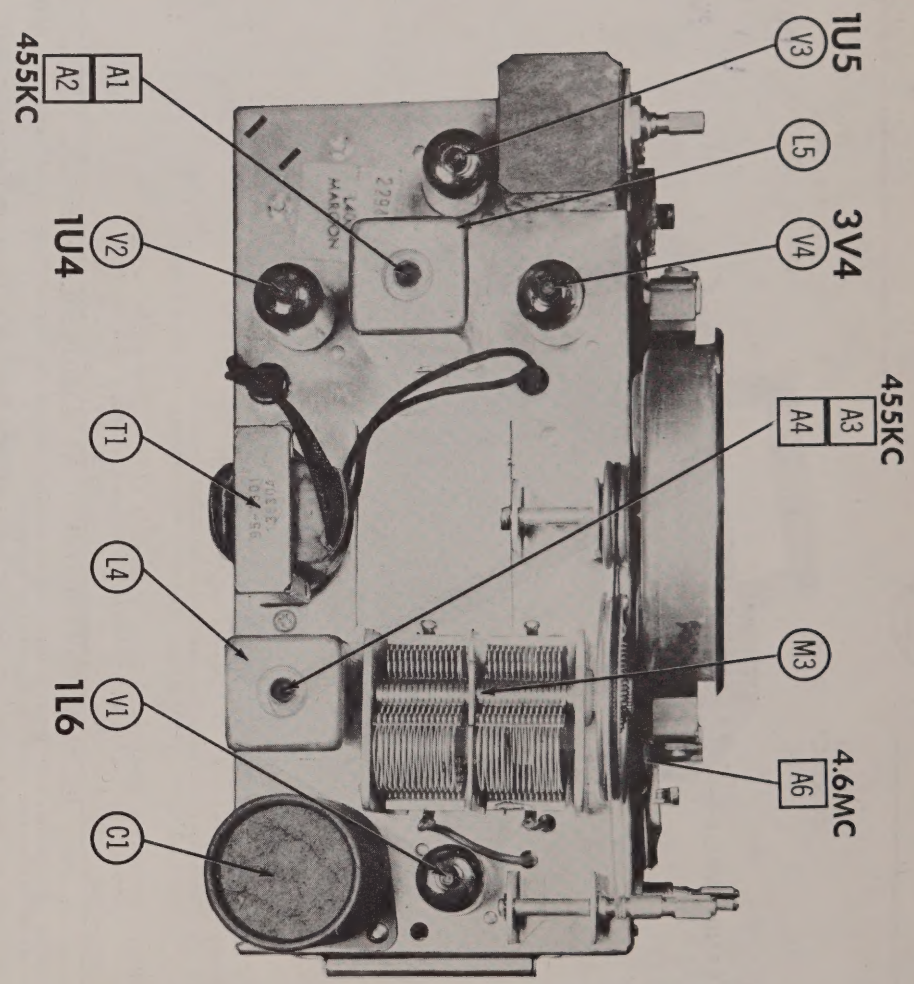
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R2	1Meg	½	63-1912	BTS-1Meg	
R3	100KΩ	½	63-1869	BTS-100K	
R4	82Ω	½	63-1740		
R5	6800Ω	½	63-1820	BTS-6800	
R6	3.3Meg	½	63-1933	BTS-3.3Meg	
R7	4.7Meg	½	63-1940	BTS-4.7Meg	
R8	5.6Meg	½	63-1943	BTS-5.6Meg	
R9	1000Ω	½	63-1786	BTS-1000	
R10	10KΩ	½	63-1827	BTS-10K	
R11	330Ω	½	63-1764	BTS-330	
R12	470Ω	½	63-1771	BTS-470	
R13	4.7Meg	½	63-1940	BTS-4.7Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ZENITH PART No.	IRC PART No.	
R14	1Meg	½	63-1912	BTS-1Meg	
R15	4.7Meg	½	63-1940	BTS-4.7Meg	
R16	3.3Meg	½	63-1933	BTS-3.3Meg	
R17	10Meg	½	63-1954	BTS-10Meg	
R18	3900Ω	1	63-2356	BTA-3900	
R19	27Ω	½	63-1719		
R20	12Ω	½			Note
R21	33Ω	2	63-2015		
R22A	1350Ω	20	63-3173		
B	1100Ω				

Note: Not used in all Models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	9.2KΩ	3.2Ω	700Ω	.48Ω	95-1301	A-3879	A-2927 ①	RO-16	S-8X ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	49-715	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	BC Ant. Coil	.3Ω		S-19815				
L2	SW Ant. Coil	.4Ω	.1Ω	S-19786				
L3A	BC Osc. Coil	.7Ω	.1Ω	S-19784				
B	SW Osc. Coil	.4Ω	5Ω					
L4	Input IF	20Ω	20Ω	95-1312	16-6666*	BC-352 †	012-C1 *	
L5	Output IF	22Ω	22Ω	95-1313		BC-355 †	12-C6 †	

* Drill mounting holes.
† Drill mounting holes and use adaptor plate.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					
	CURRENT	ZENITH PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.
M1	.062ADC	212-5	NB5	5M4	1003A	6S75	75

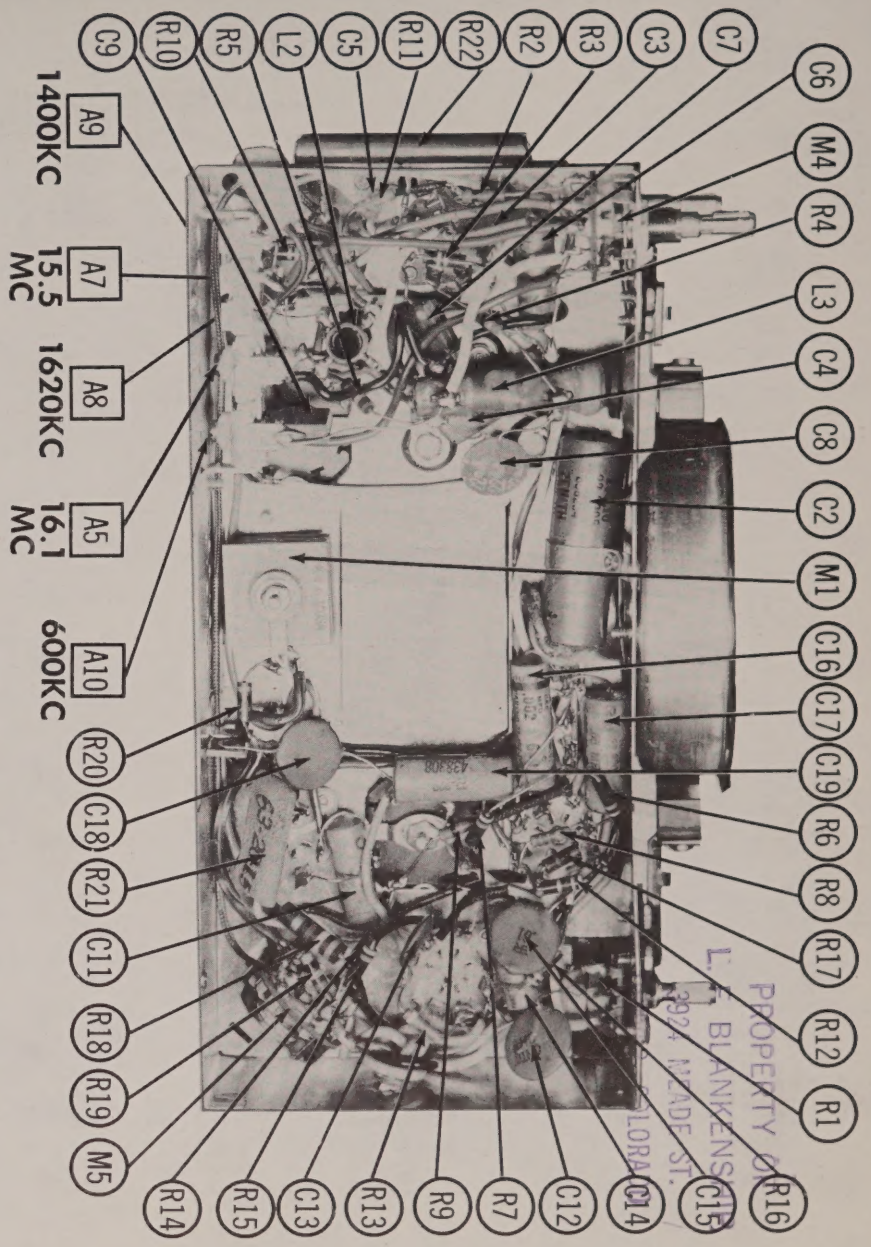
BATTERIES

ITEM No.	VOLTAGE	ZENITH PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	9V "A" 90V "B"	Z909			757			F6A60P	

MISCELLANEOUS

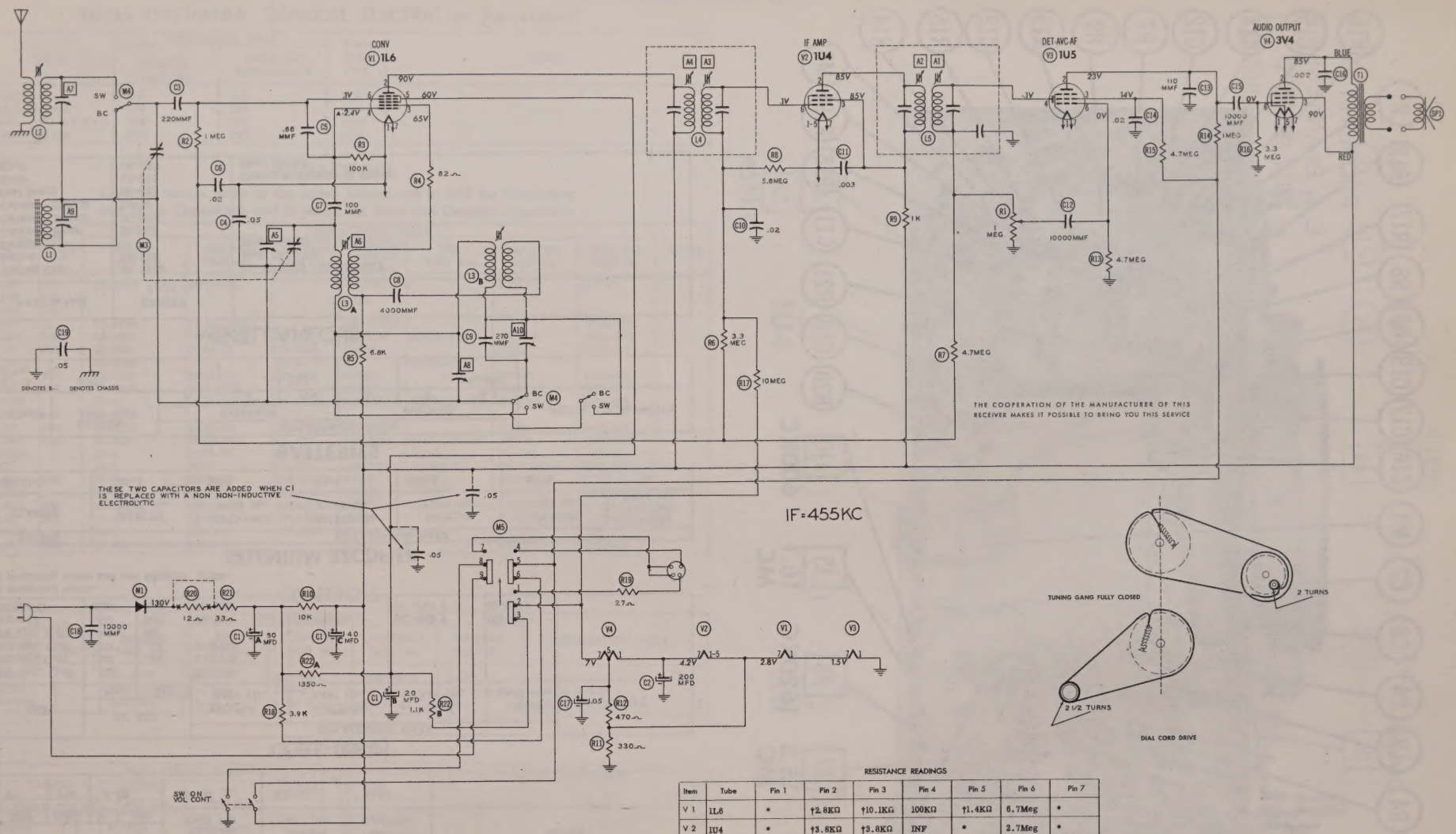
ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Tuning Cap.	22-2463	24-417MMF, 12-362MMF
M4	Switch	85-526	Band Selector
M5	Switch		Power Selector
	Cabinet Rear	14-1412	
	Cabinet Front	14-1554	
	Cabinet Handle	36-50	
	Dial Scale	26-495	
	Knob	46-975	Tuning & Volume (2 Used)
	Knob	46-1137	Band Switch

CHASSIS—BOTTOM VIEW



PROPERTY OF
L. E. BLANKENSHIP
3827 MEADE ST.
FLORAL PARK

ZENITH
MODEL L406R (Ch. 4L42)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1L6	*	†2.8KΩ	†10.1KΩ	100KΩ	†1.4KΩ	6.7Meg	*
V 2	1U4	*	†3.8KΩ	†3.8KΩ	INF	*	2.7Meg	*
V 3	1U5	*	†1Meg	†5Meg	1Meg	0Ω	4.7Meg	*
V 4	3V4	*	†3.4KΩ	†2.8KΩ	2.7Meg	*	3.3Meg	*

ALL MEASUREMENTS TAKEN WITH BAND SWITCH IN "BROADCAST" POSITION
† MEASURED FROM OUTPUT OF M1
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE
▲ MEASURED WITH VACUUM TUBE VOLTMETER.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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1- DC voltage measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.